

MINERALOGICAL ABSTRACTS

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Notices of Books.

WELL (Charles W.). *Crystal chemistry*. New York and London (McGraw-Hill), 1938, x+431 pp., 72 figs. Price \$4.50 = 25s.

This is the first text-book on crystal chemistry addressed to university students. The book as a whole is suitable for use in advanced courses, certain sections, particularly chapter I, are intended for use in the introductory course in chemistry. The systematic treatment of the subject is divided into two chapters on the elements and alloys, two on the structures and properties of binary compounds, and one on ternary compounds. Then follow chapters on silicates, Werner compounds, isomorphism, organic crystals, natural and synthetic fibres. It is only regrettable that the author should devote some space to fibre studies, particularly since he has himself contributed papers on the subject; but he omits organic structures in little more than a dozen pages, having dealt generously with fibres in over five times that number, produces a good balance in an otherwise well-planned book. Numerous references to original work are given as footnotes and the general appearance is that of a well-printed technical handbook.

F. A. B.

EVANS (R. C.). *An introduction to crystal chemistry*. Cambridge (University Press), 1939, xi+388 pp., 113 figs. Price 18s.

In 1934 Mr. Evans translated O. Hassel's 'Kristallchemie' [M.A. 1934] and, until last year [C. W. Stillwell, preceding notice], this valuable little book was the only one of its kind in English offering a treatment of the principles of architecture of the numerous crystal-structures which have been analysed. He has now written a well-balanced and up-to-date book which in its increased scope and size reflects the mass of important data that has accrued in the past five years. The book is divided into two parts: part 1, dealing with the crystal lattice, includes a useful summary of modern knowledge of the ionic, homopolar, metallic, and van der Waals bonds; part 2 is a systematic account of crystal chemistry dealing with the metallic elements, alloy systems, homopolar compounds, ionic compounds, and the molecular compounds. In the last section including, of course, organic compounds. The

division of ionic compounds according to the electrostatic valency of the bond gives a hint to future writers of text-books of mineralogy. This division consists of isodesmic (simple and multiple), mesodesmic, and anisodesmic compounds (anhydrous and hydrous), and ionic compounds containing hydrogen. The numerous tables correlating physical and chemical properties of compounds with their crystal-structures will be especially useful to students. 'A clear recognition of the different types of chemical binding and of their physical origin together with an appreciation of the essentially geometrical basis of crystal architecture and the important general conclusions which have emerged from the systematic application of X-ray structure analysis.'

F. A. B.

ADAMS (Frank Dawson). *The birth and development of the geological sciences*. London (Baillière, Tindall & Cox), 1938, v+506 pp., 15 pls., 79 text-figs. Price 22s. 6d.

This is a readable and very interesting volume, full of the quaint ideas and extravagant speculations of the ancient philosophers. During many years the author has diligently read the literature in the original sources and has collected in his library over a thousand old volumes bearing on the history of geology and mineralogy. This mass of material has been digested into a scholarly work. Besides purely geological matters, there are interesting chapters on: The generation of stones, Mediaeval mineralogy, The birth of modern mineralogy and its development from Agricola to Werner and Berzelius, The origin of metals and their ores, and a concluding chapter Quaint stories and beliefs. There are some misprints, and some of the many quotations are not exact copies of the original. [M.A. 6-26, 247].

L. J. S.

KRAUS (Edward Henry) & SLAWSON (Chester Baker). *Gems and gem materials*. 3rd edition, New York and London (McGraw-Hill), 1939, xiii+287 pp., 4 col. pls., 344 text-figs. Price \$3.50 = 21s.

This revised edition of a useful text-book shows an increase of 27 pages and 19 text-figures on the second edition of 1931 [M.A. 5-98]. Several other text-figures have been replaced, and the four coloured plates have been borrowed from Eppler's book [M.A. 6-5]. Further interesting details are given on manufactured gems, and a new chapter is added on the metals used in gem mountings. The old mineral danburite, which has recently supplied a new gemstone, is not mentioned; but the name appears as a 'deceptive and misleading' term for a man-

red corundum (p. 128) or spinel (p. 136) and 'should be [have been] ed'.

L. J. S.

ISH (George Letchworth). *Descriptive list of the new minerals 1892-1938, containing all new mineral names not mentioned in Dana's System of Mineralogy, sixth edition, 1892*. New York and London McGraw-Hill, 1939, vii+258 pp. Price \$3.00 = 18s.

is is a dictionary list of about 2200 new mineral names with brief descriptions (colour, form, specific gravity, hardness, chemical composition and locality). It has been compiled from the Appendices to Dana's 'System', Dana's 'Textbook', the American Mineralogist, Mineralogical Magazine and Abstracts, and Chemical Abstracts, to which many references are given in prominent heavy type. If these references had been complete, the book would have served as a useful index to the new mineral names in the journals quoted. There are no references to any original literature (which has evidently not been consulted), nor mention of authors and dates. Much of the information has been taken, often word for word, from the Mineralogical Magazine and Abstracts; yet we find printed on the back of the title-page 'This book, or parts thereof, may not be reproduced in any form without permission of the publishers'. Errors are plentiful, and the spellings adopted for many of the names show a disregard for their derivation.

L. J. S.

DA (D. N.). *Geology of India*. 2nd edition, London (Macmillan & Co.), 1939, xx+460 pp., 20 pls., 45 text-figs. Price 24s.

This clearly written outline of the geology of India first appeared in 1926 when the author was Professor of Geology in the Prince of Wales College at Jammu in Kashmir. A revision was issued in 1926, when he joined the staff of the Geological Survey of India. The present edition has been completely revised and brought up to date, with an increase of 60 pages and 8 text-figures, together with a large very clearly printed geological map of India on the scale of 96 miles to 1 inch. The geographical chapters, ranging from Archaean to Recent, include separate chapters on the Gondwana system, Deccan traps, ice age, and Quaternary. There are also chapters on the physical features, physiography, economic geology, and a long appendix giving a more detailed account of the geology of Kashmir. The chapter on economic geology includes a useful sketch of the mineral resources, while throughout the book there is frequent mention of ores and petrology. The well-selected illustrations give geological sections and views of scenery.

L. J. S.

TICKELL (Frederick G.). *The examination of fragmental rocks*. Stanford Univ. Press and London (Oxford Univ. Press), 1939, revised edition, x+154 pp., 1 pl., 54 text-figs. Price \$4.00 (18s.)

The author of this book, which first appeared in 1931, is Professor Petroleum Engineering in Stanford University. It collects together much useful information and data on detrital materials, for the use of mineralogists, geologists, ceramists, hydrologists, petroleum engineers, metallurgists, and chemical engineers. Matters dealt with include grain-size and mechanical analysis, porosity and permeability (this chapter rewritten), preparation of specimens (including heavy liquid, magnetic, and electrostatic separations), and identification of minerals (mainly by optical methods). The essential characters of the minerals found in sediments are listed, followed by a determination table. The bibliography of six pages contains no reference to T. Crook (1913), P. G. H. Boswell, or F. H. Hatch [M.A. 5-340, 7-56]. L. J. S.

BUTTGEBACH (H.). *Introduction à l'étude des roches ignées*. Paris (Dunod) and Liège (Vaillant-Carmanne), 1939, 136 pp., 4 plates, 22 text-figs.

This booklet gives a concise outline of the principles of the petrology of igneous rocks. In the brief description of the rock-forming minerals some of their names (lechatelierite, kaliophilite, eudialyte, &c.) are misspelt. Equilibrium diagrams illustrate the volatile constituents of mafic magmas and the crystallization of different minerals. Useful summaries of accounts are given of the 'magmatic parameters' and diagrams expressing chemical composition and of the systems of classification that have been suggested by various authors. L. J. S.

[ЛОДОЧНИКОВ (V. N.) Лодочников (B. H.). Главнейшие породы образующие минералы. 2-ое издание. [*The principal rock-forming minerals*. 2nd edition], Moscow and Leningrad, 1938, 228 pp., 45 figs.

This is a good and concise treatise on rock-forming minerals. The optical properties of minerals are not only given but discussed, and many useful hints are provided. S. I. S.

New Minerals.

GERASIMOVSKY (V. I.). *Chkalovite*. Compt. Rend. (Doklady) Acad. URSS, 1939, vol. 22, pp. 259-263, 2 figs.

This new mineral is the only beryllium mineral found in the alkali

of the Kola peninsula, although beryllium, 0.001–0.1 %, has been detected spectroscopically in 21 minerals from that region. It occurs sparingly as large grains, together with ussingite, sodalite, natro-sudalyte, &c., in foyaite-pegmatite on Punkarnayv Mtn., Lovozero Mts. It is white and semi-transparent with vitreous lustre and a fair cleavage in one direction. Sp. gr. 2.662, H. 6. Optic axial plane parallel to cleavage, $2V$ 78° , positive, α 1.544, γ 1.549. X-ray photographs show orthorhombic symmetry. Fuses readily to a clear bead; soluble in HCl and in HNO_3 . Analysis, SiO_2 56.81, Fe_2O_3 0.30, FeO 0.12, BeO 0.01, CaO 0.37, Na_2O 28.93, K_2O 0.13, H_2O — 0.23, SO_3 0.22 = 99.78, corresponds with $\text{Na}_2\text{Be}(\text{SiO}_3)_2$. L. J. S.

ANABE (Takeo). *Kotoit, ein neues gesteinsbildendes Magnesiumborat*. Min. Petr. Mitt. (Tschermak), 1939, vol. 50, pp. 441–463, 9 figs. Corrections, Ibid., 1939, vol. 51, p. 162.

Kotoit, $\text{Mg}_3\text{B}_2\text{O}_6$, ein neues gesteinsbildendes Mineral. Fortschr. Min. Krist. Petr., 1939, vol. 23, pp. clxvi–clxvii.

Kotoite occurs abundantly (>1000 tons) as a granular constituent of dolomitic marble at Hol Kol mine, Suan, Korea, where it has been associated, together with forsterite, clinohumite, spinel, ludwigite, fluoborite, &c., by the intrusion of granite into dolomite. It is orthorhombic with perfect (110) cleavage, lamellar twinning and parting (101), H. $6\frac{1}{2}$, ρ 3.11. X-ray measurements give the cell dimensions a 5.41, b 8.42, c 11.1 Å. ($a:b:c = 0.642:1:0.536$). Optic axial plane (010), $\gamma = c$, $2V$ 52° , β 1.653, γ 1.673, $2V$ 21° , positive. Soluble in hot conc. H_2SO_4 , melting-point about 1340°C . Analysis, B_2O_3 35.20, MgO 62.78, SiO_2 1.32, Fe_2O_3 0.26, FeO 0.61, CaO 0.18, $\text{H}_2\text{O} + 0.05 = 100.60$, gives formula $\text{Mg}_3\text{B}_2\text{O}_6$. This compound is readily prepared by fusing together MgO and B_2O_3 . Under hydrothermal conditions the mineral is similar to szaibelyite. In portions of the dolomite rich in iron the metamorphic products are ludwigite and magnetite. Kotoite has also been found in the interior of nodules of szaibelyite from Rézbánya, Hungary [= Băița, Romania]. L. J. S.

RUSSIA (Shin'ichi). *A new mineral "ruthenosmiridium"*. Sci. Rep. Tôhoku Univ., Ser. 1, K. Honda Anniv. Vol., 1936, pp. 527–547, 15 figs. Ruthenosmiridium in small quantity is collected together with gold in several localities in Hokkaido. Specific gravity determinations are given of several specimens, the more strongly magnetic fragments attracted by an electromagnet. A crystal of sp. gr. 18.97 gave on analysis Ir 39.018, Os 38.885,

Ru 21·080, Rh 0·986, Pt, Fe, Cu nil, agreeing with RuOsIr. It is white with perfect basal cleavage, and a Laue photograph indicates close-packed hexagonal structure.

L. J. S.

YOSIMURA (Toyohumi) [formerly Toyofumi YOSHIMURA]. *Teineite, a new tellurate mineral from the Teine mine, Hokkaidō, Japan*. Jour. Fac. Sci. Hokkaido Univ., Ser. 4, 1939, vol. 4, pp. 465–470, 7 figs.

This new mineral occurs as sky-blue prismatic crystals up to 1 cm. long together with tellurite, in the oxidized portions of tellurium veinlets in the Teine mine [M.A. 5–285, 6–430]. It is orthorhombic, $a : b : c$ 0·705 : 1 : 0·786, forms b (010), m (100), e (011), f (073); cleavage (010) good, (001) and (100) poor. Sp. gr. 3·80, H . $2\frac{1}{2}$, α ($= a$) 1·767, β ($= b$) 1·782, γ ($= c$) 1·791, $2V$ 36° , negative. Analysis, TeO_3 48·0, SO_3 6·0, CuO 28·0, H_2O 12·2, insol. 6·1 = 100·9, gives $10CuTeO_4 \cdot 3CuSO_4 \cdot 26H_2O$ or $Cu(Te,S)O_4 \cdot 2H_2O$.

L. J. S.

KOKTA (Jaroslav). *O některých širanech ze Smolníku na Slovensku*. (Über einige Sulphaten von Smolník in Slovakei). Sborník Klubu Přírodovědeckého v Brně, 1937, vol. 19 (for 1936), pp. 75–79. (Czech with German summary.)

Jarošite (pronounced Jaroschit, yarroschite; named after Zdeněk Jaroš, keeper of minerals in the museum at Brno) is a new magnesia-rich variety of melanterite; analysis I, optically negative, n 1·471–1·478 (001). *Cuprojarošite*, anal. II; crystals measured by V. Rosický show predominant (110) and (001), with $(\bar{1}01)$, $(\bar{1}05)$, (103), and (101); optical positive, mean n 1·472. Epsomite contains 9·33 % of admixed apjohnite. Apjohnite has sp. gr. 1·787, mean n 1·467, extinction-angle 27 – 28° to length of fibre. Halotrichite and copiapite are also new for this locality.

	SO_3 .	FeO .	CuO .	MgO .	MnO .	H_2O .	Total.	Sp. gr.
I.	30·13	17·10	0·04	5·55	—	47·30	100·12	1·818
II.	29·93	15·18	4·40	4·29	trace	46·50	100·30	1·868

F. S.

FRIEDRICH (O. M.) & ROBITSCH (J.). *Phosphorrösslerit ($MgHPO_4 \cdot 7H_2O$) als Mineral aus dem Stüblbau zu Schellgaden*. Zentr. Min., Abt. 1939, pp. 142–155, 11 figs.

Mud in old workings in the gold mines at Schellgaden [in Salzburg] shows glistening crystals of the new mineral phosphor-rösslerite, with characters corresponding to those of the artificial salt $MgHPO_4 \cdot 7H_2O$.

isomorphous with $\text{MgHAsO}_4 \cdot 7\text{H}_2\text{O}$. The water-clear crystals, slightly yellow from iron staining, are monoclinic; $a : b : c = 0.4455 : 2.602, \beta = 85^\circ 4',$ forms b (010), p (110), q (120), l (140), a (100), w (111), o ($\bar{1}11$). Sp. gr. 1.725, H. $2\frac{1}{2}$. Optic axial plane $\perp$ (010), $\gamma : c = +6\frac{1}{2}^\circ, \alpha 1.477, \beta 1.485, \gamma 1.486, 2V$ (red) $39^\circ 10', 2V$ (blue) 20° , negative. Analysis gave P_2O_5 28.07, MgO 16.28, H_2O (cryst., 100°) 50.86, H_2O (acid, calc.) 3.65, insol. 0.08 = 98.94. Rösslerite (en-rösslerite') and probably wappelerite are identified with the mineral salt $\text{MgHAsO}_4 \cdot 7\text{H}_2\text{O}$.
L. J. S.

N (J. A.) & ROY (P. C.). *Tiroadite, a manganese amphibole from Tiroadi, Central Provinces*. Rec. Geol. Surv. India, 1938, vol. 73, pp. 295-298, 1 fig.

This new variety of amphibole occurs as honey-yellow, coarse-bladed crystals in metamorphosed manganese ore intruded by granite. It has a prismatic cleavage and basal parting; sp. gr. 3.312, H. $6\frac{1}{2}$; optic axial plane (010), $\alpha 1.629, \beta 1.639, \gamma 1.650, 2V 88^\circ, \gamma : c = +21^\circ$. Analysis of mineral containing about 3% of braunite gave SiO_2 53.26, Al_2O_3 2.63, Fe_2O_3 2.63, FeO 1.06, MnO 8.25, MgO 31.26, CaO 1.11, Na_2O 1.56, H_2O 0.07, H_2O 0.05 = 100.50. It differs from dannemorite and richterite in containing more magnesium and from richterite in the slightly different optical data.
L. J. S.

ROCK (M. A.). *Goldschmidtine, a newly recognized antimonide of silver*. Amer. Min., 1939, vol. 24, pp. 227-242, 10 figs.

An abstract of this paper appeared in 1937 [M.A. 7-15]. Indications of twinning on (100) and (001) (in addition to cyclic twins on (110), giving a pseudo-hexagonal outline) suggest the orthorhombic disphenoidal crystal form, and the distribution of faces in zone points to the space-group C_{2h} . Previous crystallographic measurements (Hausmann, 1847), which might have been made on dyscrasite (Ag_3Sb), really belong to goldschmidtine (Ag_2Sb). Dyscrasite and artificial Ag_3Sb are hexagonal.
L. J. S.

MEL (Hans). *Ernita = Granat*. Zentr. Min., Abt. A, 1938, pp. 243-245. Reddish-brown rhombic-dodecahedra intimately intermixed with quartz from contact-metamorphic rocks at Montevideo, Uruguay, were described by Franck in 1911, and, the chemical analysis not agreeing with the garnet composition, the mineral was named ernite. A

re-examination of the original material gave n_{Na} 1.758, sp. gr. 3.6, a 11.80 Å., indicating grossular. L. J. S.

JAYARAMAN (N.) & KRISHNASWAMI (K. R.). *A chemical and mineralogical study of a new titanium mineral from Nellore district*. *Quart. Journ. Geol. Mining Metall. Soc. India*, 1938, vol. 10, pp. 97–107, 1 pl.

Black inclusions in garnet from schist differ from ilmenite in being strongly magnetic and in being soluble in cold conc. HCl. Polished sections show the characters of ilmenite; less than 8% of rutile present, but no other mineral could be detected under the microscope. Analysis gave TiO_2 65.90, Fe_2O_3 15.27, FeO 18.88, SiO_2 0.12 = 100%, approximating to $\text{FeTiO}_3 \cdot \text{Fe}_3\text{O}_4 \cdot 2\text{TiO}_2$, and it is suggested that magnetite and rutile are present in solid solution in ilmenite. L. J. S.

History and Biography.

FISCHER (Walther). *Mineralogie in Sachsen von Agricola bis Werner. Die ältere Geschichte des Staatlichen Museums für Mineralogie und Geologie zu Dresden (1560–1820)*. Dresden (C. Heinrich), 1919, viii+347 pp., 24 pls. 18 text-figs. Price RM. 13.50 (bound RM. 15.00).

An account is given from the works of G. Agricola of the state geology and mineralogy in 1550. The art collection (Kunstkammer) started by August elector of Saxony in 1560 contained ornamental stones, &c., and the mineral and other natural history collections were transferred to the Zwinger in 1728. A detailed history of the collection with biographical notes of the several curators, is given from that date to 1819. A separate chapter is devoted to the amber collection. A large part of the volume is occupied by notes from the main text. L. J. S.

GUNTHER (R. T.). *Early Science in Cambridge*. Oxford (Univ. Press), 1937, xii+513 pp., many (unnumbered) pls. and text-figs.

Historical and biographical notes are written around a series of scientific instruments that have been preserved in the several collections and laboratories. The chapters, arranged according to subjects, include one on mineralogy, in which mention is made of T. Nicols's 'Lapidary' (1652), J. Woodward's collection (1728), the succession of professors of mineralogy from E. D. Clarke (1808), W. H. Miller's two-circle goniometer (1874), &c. Minerals also appear in the lists of collections of 'materia medica' dating from the seventeenth century. L. J. S.

HER (R. T.). *Dr. William Thomson, F.R.S., a forgotten English mineralogist, 1761–c.1806*. Nature, London, 1939, vol. 143, pp. 667–668.

William Thomson was appointed lecturer in human anatomy at Edinburgh in 1786, and in the same year he was elected a Fellow of the Royal Society of London. He resigned from both of these in 1790 and afterwards lived in Italy, where he was known as G. (Guglielmo) Thomson. His collection of minerals and volcanic materials has recently been found. The mineral names *fiorite* and *sarcolite* are due to him. In a paper dated 1804 ‘*Sul ferro malleabile trovato da Pallas in Siberia*’ (Accad. Sci. Siena, 1808, vol. 9, pp. 37–57, 1 pl.) he gave a detailed description of the Krasnoyarsk meteorite with an illustration of the figures produced by dilute nitric acid; thus anticipating the observation in 1808 of Widmanstetter [which was published by K. A. von Lehn in 1812].

L. J. S.

(Max H.). *History of the “Widmanstätten” structure*. Nature, London, 1939, vol. 143, p. 764.

Attention is called to the early observation by W. Thomson [preceding paragraph].

L. J. S.

S (F. W.). *On “nitre” and “natron”*. Ann. Sci. London, 1938, vol. 3, pp. 213–216.

Soluble soda used for washing and glass making was obtained by the ancient Egyptians at Nitria and was called *nitrike*. The Greek *νίτρον*, Latin *nitrum*, and Arabic *natron* refer to the same. From the fourteenth century potassium and sodium nitrates were called *sal nitri* and *sal niter*, and afterwards *nitre* and *saltpetre*.

L. J. S.

LEVSKY (M. N.) [Годлевский (М. Н.). Успехи минералогии в СССР за двадцатилетие 1917–1937 гг.—*The progress of mineralogy in the USSR within the last 20 years*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 625–647. (Russian, with English summary, p. 647).

Brief account of work accomplished under the headings: description of minerals (with list of 60 new minerals), regional mineralogy (Kola Peninsula and Karelia, Central U.S.S.R., Ukraine, Caucasus and Crimea, Kazakhstan, Middle Asia, Siberia and the Far East), theoretical

mineralogy (energy of minerals, relationship between properties and composition, genesis), applied mineralogy, text-books, list of bibliographies.

L. J. S.

[SOBOLEV (Vladimir S.)] Соболев (Владимир). Успехи петрографии СССР за 20 лет.—SOBOLEV (Vladimir). *Progress of petrography in the USSR for the last twenty years (1917–37)*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 397–411 (Russian), pp. 411–425 (English).

Only a very brief summary is given together with a short list of literature containing 53 items.

S. I. T.

PIETSCH (E.) & BEYER (E.). *Leopold Gmelin — der Mensch, sein Werk und seine Zeit*. Ber. Deutsch. Chem. Gesell., Abt. A, 1939, vol. 72, pp. 5–33, 1 pl.

Life and work of Leopold Gmelin (1788–1853), with portrait and bibliography. He was professor of chemistry and medicine at Heidelberg (1814–51). Between 1817 and 1825 he published several mineralogical papers with chemical analyses. His 'Handbuch der Chemie' first appeared in 1817–19 and is still running; the eighth edition, started in 1924, is not yet completed and is an enormous work of reference. The Gmelin family of Tübingen included several other distinguished scientists. Leopold's father, Johann Friedrich Gmelin (1748–1804), was author of 'Grundriss der Mineralogie' (1790) and other mineralogical works. His grandfather, Philipp Friedrich Gmelin (1721–68), was Fellow of the Royal Society. Christian Gottlob Gmelin (1792–1860), second cousin, translated Berzelius's 'Mineralsystem' and made many chemical analyses of minerals. The mineral gmelinite was named after C. G. Gmelin [the initials being given incorrectly in D. Brewster's paper of 1825 and in the text-books].

L. J. S.

LACROIX (Alfred). *Une famille de bons serviteurs de l'Académie des Sciences et du Jardin des Plantes. Les Lucas*. Bull. Mus. Hist. Nat. Paris, 1938, ser. 2, vol. 10, pp. 446–471.

From 1725 to 1892 six members of the Lucas family were in the service of the Academy of Sciences and the Natural History Museum in Paris as ushers and assistants. J. A. H. Lucas (1780–1825) was the author of three books on mineralogy.

L. J. S.

ington (J. B.) [sic] (1848-1907). Univ. Toronto Studies, Geol. Ser., 1938, no. 41, 1 pl.

Portrait is given of Bernard James Harrington, who was chemist and geologist to the Geological Survey of Canada (1872-79), and Professor chemistry and mineralogy in McGill University, Montreal (1879-1907). [Min. Mag. 15-90.] L. J. S.

METZ (H.) & WEBER (L.). *Paul v. Groth. Der Gründer der "Zeitschrift für Kristallographie"*. (1843-1927). Zeits. Krist., 1938, vol. 100, pp. 5-46, 1 pl., 3 text-figs.

Account of his life and scientific work. [Min. Mag. 22-392; M.A. 1938, 467.] L. J. S.

ные труды акад. В. И. Вернадского 1888-1936 гг. [*Scientific works of academician V. I. Vernadsky, years 1888-1936*]. Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. U.S.S.R.], 1936, vol. 1, pp. 7-25.

A bibliography of the scientific writings of V. I. Vernadsky is contained, together with his portrait, in a work dedicated to him by his family and co-workers on the completion of fifty years of scientific and pedagogic activity. The two volumes of 1272 pages contain 76 original papers by many contributors grouped under geochemistry, crystallography, radioactivity, mineralogy, petrography, geology, &c. L. J. S.

EDWARDS (Edward H.). *A notable centennial in American mineralogy*. Amer. Min., 1938, vol. 23, pp. 145-148.

Dr. Dwight Dana [1813-95] produced the first edition of his 'System of Mineralogy' in 1837, which was a notable achievement for a young man aged twenty-four. The sixth edition by his son E. S. Dana appeared in 1892, and a seventh edition is now in preparation.

L. J. S.

EDWARDS (Edward H.). *Presentation of the first Roebling medal of the Mineralogical Society of America to Charles Palache*. With response by Charles PALACHE. Amer. Min., 1938, vol. 23, pp. 54-61, 2 figs.

The medal has been founded in memory of W. A. Roebling (1837-1926), a benefactor of the Society. L. J. S.

FITZ (Mildred B.). *Published works by Charles Palache*. Amer. Min. 1937, vol. 22, pp. 745-749.

A list of 120 titles for the period 1893-1936. This number (May 1937, vol. 22, no. 5) of the 'American Mineralogist', with the title-page 'Studies in mineralogy dedicated to Charles Palache' also contains a collection of 35 papers by his friends and former students, together with his portrait.

L. J. S.

PALACHE (Charles). *Present trends in mineralogy*. Bull. Geol. Soc. Amer. 1938, vol. 48, pp. 447-460. (Presidential address).

A review of recent developments in connexion with the preparation of a new edition of Dana's 'System of Mineralogy'.

L. J. S.

CHANTLER (W. E.). *The Walker Mineralogical Club*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 83-88.

This society, founded in 1938 in honour of Professor T. L. Walker, is affiliated with the Department of Mineralogy and Petrography in the University of Toronto with the object of promoting the study of Canadian minerals and rocks, and publishing annually 'Contributions to Canadian mineralogy'. This annual series of contributions was started by Walker in 1921, and in the double number for 1936-1937 is given an index for the period 1921-1937.

L. J. S.

Bibliographies.

HENGLEIN (M.). *Repertorium zum Neuen Jahrbuch und Zentralblatt für Mineralogie, Geologie und Paläontologie für die Jahrgänge 1930-1937 sowie für die Beilagebände 60-70 der Abteilung A. 63-74 der Abteilung B und Sonderband II. I. Personen-Verzeichnis*. Stuttgart (Schweizerbart), 1936-37, 1012 pp. *II. Sach-Verzeichnis*. 1937-1938, 1110 pp.

The author-catalogue and the subject-index for the six years 1930-1938 form two thick volumes. Including the abstracts (Referate) it covers a series of seven related periodicals. [M.A. 4-490, 5-245.].

L. J. S.

MARBLE (John Putnam). *Annotated bibliography on geologic time, March 1937-April 1938*. Report of the Committee on the measurement of geologic time, 1937-38, National Research Council, Washington, D.C., 1938, pp. 7-52 (mimeographed).

About 360 papers listed under authors cover a wide range of bor-

jects. In addition to titles a brief indication is given of the nature and contents of each paper. Mineralogical papers dealing with radioactive and rare-earth minerals are included.

L. J. S.

Selected bibliography of economic geology for 1935. Econ. Geol. Publishing Co., 1936, vol. 8, viii+viii+429 pp. Price \$5.00.

for 1936. Ibid., 1937, vol. 9, viii+viii+433 pp.

for 1937. Ibid., 1938, vol. 10, viii+viii+446 pp.

for 1938. Ibid., 1939, vol. 11, no. 1, viii+208 pp.

Each volume consists of two parts, each with separate numbering and each contain for each year over 2500 titles of papers with short abstracts. [M.A. 6-252].

L. J. S.

NICKLES (John M.), SIEGRIST (Marie), & TATGE (Eleanor). *Bibliography and index of geology exclusive of North America. Volume 3—1935.* Geol. Soc. Amer., 1936, xx+408 pp.

— *Volume 4—1936.* Ibid., 1937, xxi+480 pp.

— *Volume 5—1937.* Ibid., 1938, xxi+510 pp.

Each continuation [M.A. 6-251] replaces the Geological Literature of the Geological Society of London. An author-index gives full titles of papers, and when these are not in English a brief indication of their scope is given. This is followed by a detailed subject-index.

L. J. S.

MERTINS (Emma). *Bibliography of North American geology for 1933 and 1934.* Bull. U.S. Geol. Survey, 1935, no. 869, 389 pp. Price 40 cents.

— *for 1935 and 1936.* Ibid., 1937, no. 892, 504 pp. Price 50 cents.

Her work, long done by J. M. Nickles [M.A. 6-252], is now done by her compiler. For the period 1933-34 the author-index includes numbered titles and for 1935-36 4716 titles. Each is followed by a detailed subject-index.

L. J. S.

NICKLES (John M.). *The American Mineralogist: Journal of the Mineralogical Society of America. Index to volumes 1-20, 1916-1935.* 1936, 98 pp. Price \$2.00 (\$1.00 to subscribers).

A single alphabetical index includes authors (with titles of papers), subjects, and localities. While most of the locality entries are collected together under countries or states, others appear under provinces and districts.

L. J. S.

- Bibliographie des sciences géologiques.* Paris (Soc. Géol. France), 1935, ser. 2, vol. 6 (for 1935), 294 pp. Price 100 fr. [M.A. 6-252.]
- 1937, ser. 2, vol. 7 (for 1936), 371 pp.
- 1938, ser. 2, vol. 8 (for 1937), 338 pp.
- 1939, ser. 2, vol. 9 (for 1938), 344 pp.

Index 1932. Schweden. A. KÖHLER & A. MARCHET. Min. Petr. Mus. (Tschermak), 1937, vol. 48, pp. 413-417.

— *Norwegen.* H. ROSENDAHL & A. MARCHET. Ibid., pp. 423-428.

Index 1933. Schweden. A. KÖHLER & A. MARCHET. Ibid., pp. 418-422.

— *Norwegen.* Halvor ROSENDAHL. Ibid., pp. 429-433.

Index 1933 und 1934. Slawisches Sprachgebiet. Zweiter Teil: *Polen.* R. FLESZAR. Ibid., 1936, vol. 48, pp. 255-261.

— — — — — Dritter Teil: *Tschechoslovakisches Sprachgebiet.* F. SLAVINSKY. Ibid., pp. 262-271.

— — — — — Vierter Teil: *Jugoslawisches Sprachgebiet.* L. DOLAR-MATKOVIC. Ibid., pp. 272-274.

— — — — — Fünfter Teil: *Bulgarisches Sprachgebiet.* N. NIKOLOW. Ibid., 1936, vol. 48, p. 140.

Index 1935. Ungarisches Sprachgebiet. B. MAURITZ. Ibid., 1936, vol. 47, pp. 523-528.

These indexes [M.A. 6-255] are now discontinued. Part I (Russian) of the Slavonic languages for 1933-34 did not appear. L. J. S.

SANDEGREN (R.). *Revue annuelle de la littérature géologique suédoise 1935.* Geol. För. Förh. Stockholm, 1937, vol. 58 (for 1936), pp. 567-589.

— — — — — 1936. Ibid., 1937, vol. 59, pp. 469-502.

— — — — — 1937. Ibid., 1939, vol. 60 (for 1938), pp. 555-589. [M.A. 6-253].

FISCHER (Walther). *Arbeiten über Sachsens Mineralogie, Geologie und Paläontologie aus dem Jahre 1935. Mit Nachträgen aus früheren Jahren.* Sitzungsber. Naturwiss. Gesell. Isis, Dresden, 1936, for 1935, pp. 1-135.

— *Arbeiten über Sachsens Mineralogie, Geologie und Paläontologie aus den Jahren 1936 und 1937. Mit Nachträgen aus früheren Jahren.* Ibid., 1938, for 1936-37, pp. 59-84.

An author catalogue of titles in continuation of previous lists [M.A. 6-253]. L. J. S.

ET (Alphonse). *Bibliographie géologique de la Suisse pour les années 1921 à 1930*. Mat. Carte Géol. Suisse, 1936, nouv. sér., no. 73, li+496 pp.

es of papers under authors (4135 entries), with cross-references to the headings petrography, mineralogy, meteorites, &c. L. J. S.

grafia geologica italiana per l'anno 1934. Boll. R. Ufficio Geol. Italia, 1936, supplement to vol. 61, 175 pp. [M.A. 6-253.]

grafia geologica italiana per gli anni 1915-1933. Africa orientale italiana. Boll. R. Ufficio Geol. Italia, 1936, supplement to vol. 61, 16 pp.

ARZ (Rudolf). *Mineralogicko-geologická bibliografie Čsl. republiky za rok 1932 a 1933 (s doplňky za rok 1930-1931)*. Věstník Státního ústavu Československé republiky, 1935, vol. 11, pp. 138-177. *za rok 1934 a 1935*. Ibid., 1937, vol. 13, pp. 287-332.

za rok 1936. Ibid., 1938, vol. 14, pp. 43-68.

es of papers arranged according to authors, for the years 1932-33 and supplement for 1930-31, and for 1934-35 and 1936. [M.A. 6-254.]

F. S.

graphia geologica hungarica 1935. Földtani Közlöny, Budapest, 1936, vol. 66, pp. 233-240; 1937, vol. 67, pp. 96-98.

1936. Ibid., 1937, vol. 67, pp. 230-240.

1937. Ibid., 1938, vol. 68, pp. 247-260. [M.A. 6-254.]

SA-FLESZAROWA (R.). *Bibliografia geologiczna Polski.—Bibliographie géologique de la Pologne*. Serv. Géol. Pologne, Warszawa, (n.d.), no. 13, 24 pp.

No. 14 (for 1934, with supplement for 1933), 30 pp.

No. 15 (for 1935, with supplement for 1934), 28 pp.

No. 16 (for 1936, with supplement for 1935), 59 pp.

No. 17 (for 1937, with supplement for 1936), 1938, 51 pp.

13 gives a few supplementary entries and a complete index of references to nos. 1-12 (1914-33) [M.A. 5-249]. A date of publication is given only on no. 17. L. J. S.

graphie polonaise. Arch. Min. Tow. Nauk. Warszaw. (Arch. Min. Soc. Sci. Varsovie), 1936, vol. 12, pp. 193-198.

es of Polish papers published in 1935 on mineralogy and petrology with short abstracts in French. [M.A. 6-254.] L. J. S.

Bibliografia polska.—Bibliographie polonaise. Arch. Min. Tow. Nauk. Warszawy. (Arch. Min. Soc. Sci. Varsovie), 1938, vol. 14, pp. 101-107.

Titles of Polish papers published in 1936-38 on mineralogy and petrography, in a few cases with translated titles but no abstracts. L. J. S.

LAITAKARI (Aarne). *Geologische Bibliographie Finnlands 1555-1934*. Bull. Comm. Géol. Finlande, 1934, no. 108, 224 pp.

An author-catalogue of books and papers on geology, petrology, mineralogy, ore-deposits, and crystallography. L. J. S.

[SHUBNIKOVA (O. M.)] Шубникова (О. М.). Литература о минералогии Южного Урала. [*Literature on minerals of the southern Ural*]. Мин. Инст. Акад. Наук СССР, Минералогия СССР, Сер. Б. вып. 16. [Min. Inst. Acad. Sci. USSR, Mineralogy of USSR, Ser. B, no. 16]. Leningrad, 1933, 16 pp. Price 4r.

[GODLEVSKY (M. N.) & NEMILOVA (A. V.)] Годлевский (М. Н.) и Немилова (А. В.). Литература по кристаллографии и минералогии за 1935 г. (СССР).—*Literature on crystallography and mineralogy for 1935 (USSR)*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1936, ser. 2, vol. 65, pp. 193-204 (Russ.), 205-212 (Engl.).

This gives 208 titles (in Russian and in English translation) and titles in other languages, of papers on crystallography and mineralogy published during 1935, arranged alphabetically under authors. An additional list of 10 titles published during 1934 is also given. [M. N. 6-254.] S. I. T.

[GODLEVSKY (M. N.) & NEMILOVA (A. V.)] Годлевский (М. Н.) и Немилова (А. В.). Литература по кристаллографии и минералогии за 1936 г. (СССР).—GODLEVSKY (M. N.) and NEMILOVA (A. V.). *Literature on crystallography and mineralogy for 1936 (USSR)*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 580-610.

An author-list (in Russian with English translation) is given of works published during 1936 in Russia and abroad, and an additional list of 36 works published in 1935. S. I. T.

SOBOLEV (Vladimir S.)] Соболев (Владимир). Литература по петрографии и петрологии за 1935 год (СССР).—SOBOLEV (V.). *Literature on petrography and petrology in 1935 (USSR)*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1936, ser. 2, vol. 65, pp. 454–460 (Russian), pp. 460–465 (English).

continuation on the same plan as before [M.A. 6–255], but now giving references to periodicals in the English translation. 168 titles are

L. J. S.

SHAFRANOVSKY (I. I.) & SHNEIDER (Y. A.)] Шафрановский (И. И.) и Шнейдер (Ю. А.). Обзор работ по кристаллографии в СССР за десятилетие с 1927 по 1937 г. Очерк 1.—SHAFRANOVSKY (I. I.) & SHNEIDER (G. A.). *Review of works on crystallography in the USSR (1927–1937), Article 1*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1937, ser. 2, vol. 66, pp. 201–210 (Russian), pp. 211–219 (English).

NEMILOVA (A. V.)] Немилова (А. В.). Литература по кристаллографии за 1927–1936.—NEMILOVA (A. V.). *Literature on crystallography 1927–1936*. Ibid., pp. 220–234.

The first article gives a review of Russian works dealing with geological crystallography. The second article gives a list of 408 papers published on this subject.

S. I. T.

SHINSKAYA (M. V.) & SHUBNIKOVA (O. M.)] Снежинская (М. В.) и Шубникова (О. М.). Советская книжная литература по геологическим наукам за 1937 год. [*The USSR non-periodical literature on geological sciences for 1937*.] Изв. Акад. Наук СССР, Отд. Мат. Ест., Сер. Геол. (Bull. Acad. Sci. URSS, Cl. Sci. Math. Nat., Sér. Géol.), 1938, pp. 837–858.

Tables of books under the several headings geology, crystallography, petrology, economic geology, &c.

L. J. S.

BOUCHE (T. H. D.) [1855–1938]. *Index to the Records of the Geological Survey of India. Volumes I–LXV, 1868–1932*. Calcutta, 1936, viii+718 pp. Price Rs. 6–12 = 11s.

The catalogue of authors and titles of papers (105 pp.) is followed by a detailed index of subjects, making a larger volume than the index to the *Memoirs* by the same compiler [M.A. 5–250].

L. J. S.

LA TOUCHE (T. H. D.) [1855-1938]. *Geographical index to the Memoirs, volumes I-LIV, Records, volumes I-LXV of the Geological Survey of India*. Calcutta, 1938, pp. xvi+576. Price Rs. 6-12 = 11s.

An alphabetical index of place-names giving the latitude and longitude of each. The method adopted for the spellings of place-names explained. L. J. S.

JAMES (Wm. T.). *A bibliography of Gold Coast geology, mining and archaeology*. Bull. Gold Coast Geol. Surv., 1937, no. 9, 57 pp. Price 2s.

SPARN (Enrique). *Bibliografía de la geología, mineralogía y paleontología de la República Argentina. Parte VII: Años 1932, 1933, 1934 y 1935*. Bol. Acad. Nac. Cien. Córdoba, 1936, vol. 33, pp. 221-279.

Titles of 538 publications arranged under authors, with an index of subjects and localities. L. J. S.

SCHLOSSMACHER (K.). *Datensammlung gesteinsbildender Mineralien und Gesteine 1933*. Fortschr. Min. Krist. Petr., 1937, vol. 21, pp. 341-405, 3 figs.

Continuation of the collection of data on rock-forming minerals. [M.A. 6-257.] L. J. S.

Precious Stones.

MEYERHOFF (Howard A.) & FOSTER (Mary Louise). *The book of stones, a thirteenth century manuscript*. Proc. Geol. Soc. Amer., 1937, vol. 52, p. 90. 1936, p. 90. (Abstract.)

Among the documents in the library of San Lorenzo of El Escorial 'The book of stones', a translation from the Arabic of Abolays into Spanish, made in 1276 by command of Alfonso X, hence known as 'lapidario de Alfonso el Sabio'. Although the original Chaldean manuscript is undated, it presumably belongs to the eighth or ninth century, possibly to the fourth. L. J. S.

BOLMAN (J.). *De edelsteen en uit den bijbel, gezien in het licht der hedendaagsche edelsteenkunde*. Med een voorwoord van W. D. v. WIJNGAARDEN. Amsterdam (H. J. Paris), 1938, 138 pp.

An attempt to identify the precious stones mentioned in the Bible in the light of present-day knowledge of gem minerals. L. J. S.

2. (Sydney H.). *Luminous gems, mythical and real*. Scientific Monthly, New York, 1938, vol. 47, pp. 496-505.

A collection of ancient myths relating to stones shining in the dark, of which are associated with the fiery colour of 'carbuncle'.

L. J. S.

3. CALF (N. L.). *Refractive indices of uniaxial gemstones. Their determination by the method of minimum deviation*. Gemmologist, London, 1939, vol. 8, pp. 97-99, 1 fig.

The value of ω is obtained directly, and ϵ can be calculated from the observed value for the extraordinary ray and the angle this makes with the optic axis of the crystal. This angle is determined from the extinction directions when the stone is immersed in a liquid of nearly the same refractive index.

L. J. S.

4. ER (W. Fr.). *Die Brillanz durchsichtiger Edelsteine*. Fortschr. Min. u. Krist. Petr., 1938, vol. 23, pp. 1-40, 38 figs.

5. *Beitrag zum Brillanzproblem*. Zentr. Min., Abt. A, 1939, pp. 53-60, 3 figs.

An extension of a previous paper [M.A. 7-125] giving the angles for facets, calculated from the optical data for different kinds of stones, so that the cut forms shall display the maximum brilliancy. L. J. S.

6. ER (Wilhelm). *Vollreflexbrillanten*. Zentr. Min., Abt. A, 1938, pp. 230-239, 3 figs.

A modification is given of Johnsen's equations [M.A. 3-437] for calculating the angles of the facets in brilliant-cut stones of different refractive indices to give the maximum amount of total reflection. A table of angles is given for different values of n . [M.A. 6-492.] L. J. S.

7. GHEIMER (H.). *Die Schleifhärte des Diamanten und seine Struktur*. Neues Jahrb. Min., Abt. A, 1938, Beil.-Bd. 74, pp. 318-332, 5 figs.

The grinding and sawing hardness of diamond is greater on (111) than on (100) and (110). On (100) and (110) the directions of least hardness are parallel to the crystal axes, and on (111) perpendicular to the cuboctahedral edges. These differences in hardness in different directions are correlated with a structure built up of fundamental units (consisting of a combination of the tetrahedron and rhombic-dodecahedron).

L. J. S.

VENKATARAYUDU (T.). *Normal frequency of the diamond lattice*. Proc. Indian Acad. Sci., Sect. A, 1938, vol. 8, pp. 349–352, 1 fig.

Although the diamond lattice may be regarded as an interpenetration of two cubic face-centred lattices, its proper basis consists of only two atoms, the positions of which referred to rhombohedral axes are (00) and $(\frac{1}{4} \frac{1}{4} \frac{1}{4})$. The lattice has only one limiting mode of oscillation, which is active in the Raman spectrum and inactive in infra-red absorption. The two interpenetrating lattices oscillate against each other in an arbitrary direction. This agrees with the one strong line (1332 cm.⁻¹) in the Raman spectrum of diamond. The weaker lines and also the infra-red absorption maxima are regarded as secondary effects.

L. J. S.

[VOLIN (A.)] Волин (А.). Возраст алмазов и Крестовоздвиженская россыпь на Урале.—VOLIN (A.). *The age of diamonds and the Krestovozdvijensk placer in the Urals*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min., 1938, ser. 2, vol. 67, pp. 489–502 (Russian with English summary)).

The few diamonds found in the gold-washings at this locality are gravels resting on limestone; they have been derived from sedimentary rocks of lower Palaeozoic or more probably of pre-Cambrian age. In India, Brazil, and the Witwatersrand diamond occurs in pre-Cambrian sediments, and probably also in British Guiana, Belgian Congo, and Angola. The age of the Kimberley diamond pipes is not definitely known. Most occurrences are thus in the most ancient rocks, and not in more recent mountain areas of the Alpine type.

L. J. S.

WILLIAMS (Horace E.). *Derby on the genesis of the diamond*. Econ. Geol., 1938, vol. 33, pp. 351–354.

The diamond of Brazil was at one time considered to have originated in acid rocks, but later various basic rocks were discovered and the occurrence was compared by O. A. Derby with that in South Africa. More recently, the earlier idea has been revived. [M.A. 5–275–277.] L. J. S.

KNETSCH (Georg). *Nach dem Kriege entdeckte Diamantlagerstätten nördlich des Äquators*. Zeits. Deutsch. Geol. Gesell., 1938, vol. 9, pp. 457–469, 7 figs.

A review is given of the literature on the discovery and occurrence

Diamond in West Africa—Gold Coast, Sierra Leone, Liberia, Ivory Coast, French Guinea, and Nigeria. L. J. S.

W. ZENTR. (Viktor). *Der Diamant „Presidente Vargas“*. Zentr. Min., Abt. A, 1939, pp. 99–102, 4 figs.

A diamond of the 'first water' weighing 726.60 carats (slightly more than the 'Jonker' [M.A. 6-493]) was found on August 13, 1938, in new alluvial workings on the Rio Santo Antonio, Coromandel municipality, Minas Geraes. It is a flattened stone of irregular shape measuring 51.0×24.4 mm., with a large cleavage surface only slightly water-worn and with minute triangular pits, and two rounded surfaces near the top. A diamond of 172.50 carats, the 'Minas Geraes', had been found only a few days before in the same district. L. J. S.

WEIGEL (O.) & KRÜGER (E.). *Die Saphirlagerstätte von Bo Ploi in Siam. II. Teil*. In: WEIGEL (O.). *Wissenschaftliche Ergebnisse meiner Forschungsreisen in Ostasien*. Marburg, 1934, Heft 1, iii+41 pp., 22 pls., 7 text-figs.

This deposit of sapphire in western Siam ($14^{\circ} 19' 23''$ N., $99^{\circ} 31' 2''$ E.) was discovered in 1926, and the new mining village was named Bo Ploi (Bo = spring, ploi = gemstone). The locality was visited by O. Weigel in 1928 and 1933. In 1933 180–200 miners were working shallow pits in the weathered surface debris derived from theralite. The corundum is usually light to dark grey, and stones of good gem quality are small and few. Inferior stones and black spinel are cut at Bo Ploi and those of better quality at Bangkok. The crystals are much corroded by magmatic absorption. They are tabular in habit often with a metallic sheen on the basal plane of parting. Only very occasionally is sapphire found actually free from theralite. This rock (anal. I, avoiding larger inclusions) contains (several cm.) phenocrysts of titanite (anal. II, sp. gr. 3.472, $\alpha = 43^{\circ}$, $2V = 61^{\circ}$) and anorthoclase (anal. IV, sp. gr. 2.606, $\alpha = 1.5264$, $n = 1.5309$, $\gamma = 1.5317$, $2V = 47^{\circ} 45'$, extinction-angle on (001) $\frac{1}{2}^{\circ}$ on (010) 6.3°). Diopside of the groundmass gave anal. III, sp. gr. 3.337, $2V = 73.4^{\circ}$, $\gamma:c = 46^{\circ}$, $2V = 59^{\circ}$. The rock also contains nepheline, olivine (anal. gr. 3.383–3.385, $2V_{\alpha} = 85\frac{1}{2}^{\circ}$ – $95\frac{1}{2}^{\circ}$, $\alpha = 1.6611$, $\beta = 1.6797$, $\gamma = 1.6981$), celestine (anal. V–VII, sp. gr. 3.85, 3.85, 3.82, $n = 1.75$, melting-point of VII 1975°), titanomagnetite (anal. VIII, sp. gr. 4.91), rarely zircon; blocks of sandstone into which it was intruded, and blocks of white and gneiss from a deep-seated source. The corroded crystals

of sapphire were probably caught up by the magma from a deep-seated pegmatite.

	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O	H ₂ O
I.	45.23	2.00	14.79	3.67	5.67	0.17	7.38	8.85	4.51	3.52	2.99
II.	47.31	2.09	8.58	3.39	3.88	0.10	12.81	20.23	1.51	0.04	0.83
III.	46.82	2.53	5.84	9.91	—	0.17	12.14	22.46	0.88	0.59	—
IV.	63.49	trace	20.93	0.29	—	0.00	0.03	0.93	6.05	7.27	—
V.	4.54	0.92	55.62	21.34	n.d.	—	17.91	total 100.33.			
VI.	1.83	0.75	57.31	12.27	8.72	—	18.81	„	99.69.		
VII.	1.95	0.54	59.76	9.37	8.57	—	19.35	„	99.54.		
VIII.	1.07	6.30	10.60	66.42	16.27	—	—	„	100.66.		

I. also ZrO₂ 0.05, Cr₂O₃ 0.03, rare-earths 0.05, NiO 0.02, BaO 0.06, SrO 0.1, P₂O₅ 1.01, S 0.08, F 0.10, H₂O = 0.38, total 100.66. II, H₂O = 0.02, total 100.7. III, P₂O₅ 0.64, total 101.98. IV, BaO 0.46, SrO 0.38, total 99.83.

L. J. S.

THOSAR (B. V.). *On the fluorescent ion of chromium in ruby*. Phil. Mag.

London, 1938, ser. 7, vol. 26, pp. 380–389, 4 figs.

— *The fluorescent chromium ion in ruby*. Ibid., pp. 878–887, 1 pl., text-fig.

The fluorescence spectrum of ruby and sapphire is discussed, especially with regard to the Zeeman effect (which shows marked anisotropy) and the temperature-sensitive anti-Stokes bands. The experimental data are readily explicable only if it is supposed that the chromium is present as Cr⁺⁺⁺ in true isomorphous replacement of Al⁺⁺⁺. The anti-Stokes bands are probably connected with the vibrations of the group Cr—O₃—Cr in the crystal. In sapphire, the isomorphous replacement of Al⁺⁺⁺ by Cr⁺⁺⁺ is much smaller.

M. H. H.

[USPENSKY (N. M.) Успенский (Н. М.). Материалы для познания генезиса месторождения изумрудов Монетной дачи на Урале. USPENSKY (N. M.). *Contributions to the knowledge of the emerald deposits of the Sverdlovsk mining district in the Urals*. Зап. Ленинград. Горн. Инст. (Ann. Inst. Mines, Leningrad), 1938, vol. 1, pp. 161–197, 2 pls. (map 1:15,000), 24 text-figs., pp. 197–200 (English summary).

The emerald mines are in the Monetnaya range on the eastern slope of the Urals 70 km. NNE. of Sverdlovsk (= Ekaterinburg). They are in a complex of metamorphic rocks consisting of amphibolites and plagioclase amphibolites with large lenses of talcose rocks, the latter containing relics of serpentine and peridotite. These rocks are surrounded by intrusions of granite and gabbro-diorite, from which veins of several types, high-temperature pegmatitic to low-temperature endohyalitic

penetrate the metamorphic rocks. The fluorite-beryl veins with associated phlogopite (not biotite) are of late formation at an estimated temperature of 200–500°. Descriptions are given of these rocks and minerals, and 42 mineral species found in them are listed. L. J. S.

USPENSKY (N. M.) [Успенский (Н. М.). К минералогии изумрудных месторождений. — USPENSKY (N. M.). *Contribution to the mineralogy of the emerald mines (Ural)*. Зап. Всеросс. Мин. Общ. (Mém. Soc. Russe Min.), 1938, ser. 2, vol. 67, pp. 481–484, 1 fig. (Russian with English summary.)

Further notes on the rarer minerals bismuth, molybdenite, and others from the emerald mines. L. J. S.

WALSER (W. Fr.). *Ein außergewöhnlich großer Olivinkristall von Edelsteinqualität*. Zentr. Min., Abt. A, 1939, pp. 102–105, 3 figs.

A broken crystal of yellowish-green olivine of gem quality, weighing 70 grams, is tabular on (100) with (010), (110), (101), (021), (111). Measurements gave $a:b:c = 0.4645:1:0.5845$. Sp.gr. 3.56. L. J. S.

PERSON (B. W.) & PAYNE (C. J.). *An exceptional danburite*. Gemmologist, London, 1939, vol. 8, p. 105, 1 fig.

A wine-yellow, step-cut stone weighing 138.61 carats, from Mogok, Burma, has sp.gr. 2.998, α 1.633, β 1.6361, γ 1.639. Other cut danburites have sp.gr. 2.999–3.004. They show didymium bands in the absorption spectrum and a sky-blue fluorescence in ultra-violet rays. [This stone now in the mineral collection of the British Museum.] [M.A. 5–398.]

L. J. S.

WALSER (Walther). *Das Amethyst-Vorkommen von Purschenstein im Erzgebirge*. Sitzungsber. Naturwiss. Gesell. Isis, Dresden, 1938, for 1936–37, pp. 45–50, 1 fig.

Historical notes on the mining of fibrous amethyst at this locality in Saxony in the early part of the eighteenth century. L. J. S.

LENGYEL (vitéz Endre). *SiO₂-ásványok a tokaj-hegyaljai jáspisokban*. — LENGYEL (E.). *SiO₂-Minerale in den Jaspissen des Tokaj-Hegyalja-Gebirges*. Földtani Közlöny, Budapest, 1936, vol. 66, pp. 278–294, 1 pl., 2 text-figs. (German only). [M.A. 6–501.]

The origin of the jaspers of the Tokaj-Hegyalja Mountains is connected with the post-volcanic phenomena. Their primary substance was

opal, which passed by dehydration and recrystallization into cryptocrystalline, micro-, and phanero-crystalline forms of silica minerals. Sections of amygdales show the following series: opal→chalcedony→lutecite→quartzine→quartz; but under varying conditions this series may be incomplete. Lussatite and cacholong are considered to be secondary modifications derived from some of the other forms. Descriptions of several forms include their morphological features, optical properties, replacements, and genetic relationships. The main portion of the crystalline material consists of radiating fibres of lutecite. A possible new form of silica is prismatic with one end pointed, refractive index higher than that of lutecite, birefringence equal to that of quartz, and optic axial angle 70° , negative.

V. Z.

PARSONS (A. L.). *Additional semi-precious and ornamental stones of Canada*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 45-46. [Cf. M.A. 6-203.]

Mention is made of rock-crystal from St. Remi d'Amherst, Quebec; banded jaspilite from McInnes lake, Ontario; bluish-green apatite from Monmouth, Ontario; scapolite cat's-eye from Grenville, Quebec; serpentine from Kilmar, Quebec; cadmium-yellow idocrase and drab-coloured diopside from Laurel, Quebec; and lazulite from near Fort Churchill, Hudson Bay.

L. J. S.

SPERISEN (Francis J.). *Gem minerals of California*. California Journal of Mines & Geol., 1938, vol. 34, pp. 34-78, 1 pl., 6 text-figs.

Descriptions are given of a large number of minerals stating their localities where they have been found, though not always of gem quality.

L. J. S.

CALMBACH (W. Friedrich von). *Handbuch brasilianischer Edelsteine und ihrer Vorkommen*. Rio de Janeiro (N. Medawar), 1938, 220 pp. Price [13s.]

The general part (pp. 14-72) gives an outline of mineralogical characters, and the remaining special part deals with about thirty kinds of gem minerals found in Brazil. A general account of each mineral is followed by notes on occurrences in Brazil together with list of localities in each State. From the manner in which these localities are set out and the punctuation the statements are not always quite intelligible. The most important minerals are diamond, topaz, beryl, tourmaline, and many quartz varieties.

L. J. S.

Topographical Mineralogy.

HENS (F. J.). *The ancient mining districts of Cornwall*. Ann. Rep. Roy. Cornwall Polytech. Soc., 1938, no. 150, new ser., vol. 9, part 2, pp. 33-55.

account is given of the several abandoned mines in the parishes of St. Agnes, and the NW. part of Perranzabuloe, with statistics of the amounts of copper and tin ores that they have produced. L. J. S.

SEL (Percy). *Minerals of the Varuträsk pegmatite. XIII. Pollucite, its vein material and alteration products*. Geol. För. Förh. Stockholm, 1939, vol. 60 (for 1938), pp. 612-634, 7 figs. [Cf. M.A. 7-120.]

Large masses (several hundred kg.) of pollucite, resembling quartz, have been found in the 1938 quarry in pegmatite. Isotropic, n_{Li} 1.5190, n_{Tl} 1.5218, n_{Tl} 1.5256; sp. gr. 2.917. Analysis by T. Berggren, SiO_2 55.71, Al_2O_3 16.71, Fe_2O_3 0.01, Li_2O 0.25, Na_2O 1.87, K_2O 0.51, Rb_2O 0.03, Cs_2O 30.77, H_2O + 1.80, F 0.03, P_2O_5 0.25 = 100.08, shows a slight excess of SiO_2 (as impurity) and H_2O over the formula $H_2Cs_4Al_4(SiO_3)_9$. The mineral is penetrated by grey veins of albite; pink veins of oncosine; green veins of 'diaspodumene' (a symplektic intergrowth—'perthite'—of spodumene and a hypothetical caesium-spodumene) and an allanite-ecryptite symplektite (β -spodumene of Brush and Dana, 1880). The alteration product is a clay resembling cimolite. L. J. S.

SEL (Percy) & GABRIELSON (Olof). *Minerals of the Varuträsk pegmatite XIV. The tourmaline group*. Geol. För. Förh. Stockholm, 1939, vol. 61, pp. 63-90, 12 figs.

Black iron-tourmaline is abundant in the marginal portions of the primary microcline-pegmatite, while coloured lithia-tourmalines occur in the cleavelandite and lepidolite in the replacement pegmatite. Beyond the predominance of iron in schorl, no relation can be traced between chemical composition and colour and the optical data. The coloured tourmalines show a zonal growth with a red core and a green shell. They are sometimes altered to cookeite [M.A. 7-108] or lepidolite; and sometimes the red core (but not the green shell) is altered to a myrmekitic growth of quartz and albite.

SiO_2 .	TiO_2 .	B_2O_3 .	Al_2O_3 .	Fe_2O_3 .	FeO .	MnO .	MgO .	CaO .	Li_2O .	Na_2O .
35.76	0.25	10.00	34.76	*	12.99	0.33	0.58	0.00	0.11	3.06
37.30	0.06	10.18	37.63	*	4.53	1.04	0.00	0.18	1.05	4.24
38.10	0.09	10.70	38.50	*	3.87	0.46	0.10	0.10	1.52	2.93
39.06	0.02	10.88	41.78	0.035	—	0.45	0.02	0.72	1.55	2.48

	K ₂ O.	Rb ₂ O.	F.	H ₂ O+.	H ₂ O—.	Total.	Sp. gr.	ω_{Na^+}	ϵ_N
I.	0.06	0.00	0.37	1.93	0.01	100.21	3.178	1.6607	1.63
II.	0.10	0.00	0.77	2.80	0.00	99.88	3.110	1.6427	1.62
III.	0.21	0.00	0.77	2.69	0.00	100.04	3.065	1.6423	1.62
IV.	0.25	0.01	0.92	3.02	0.00	100.195	3.025	1.6391	1.62

* In I-III all Fe calculated as FeO. In II some quartz.

- I. Black schorl, (Na,K)₂(Fe,Mn,Mg)₄Al₁₄B₆Si₁₂H₄(O,OH,F)₆₂.
- II. Blue indicolite, (Na,K,Ca)₃Li_{1.5}(Fe,Mn)_{1.5}Al₁₅B₆Si₁₂H₆(O,OH,F)₆₃.
- III. Green verdelite, (Na,K,Ca)₂Li₂(Fe,Mn,Mg)Al₁₅B₆Si₁₂H₆(O,OH,F)₆₃.
- IV. Red rubellite, (Na,K,Ca)₂Li₂Al₁₆B₆Si₁₂H₆(O,OH,F)₆₃.

L. J. S.

HIBSCH (J. E.). *Die Minerale des Böhmisches Mittelgebirges*. Min. Petr. Mitt. (Tschermak), 1937, vol. 49, pp. 442-458, 2 figs.

Supplementary notes to the author's book on the minerals of the Midland Mountains of Bohemia. [M.A. 5-482.] L. J. S.

HIBSCH (J. E.). *Einige neue Mineralfunde im Böhmisches Mittelgebirge*. Min. Petr. Mitt. (Tschermak), 1939, vol. 50, pp. 487-488.

Calcite as water-clear octahedral-like crystals in cavities in gaultite in the Toller Graben near Wesseln. Stilbite in crevices in metamorphosed marl at the contact with the Hegeberg phonolite near Eulau. Gismonteite, epidote, phillipsite, chabazite, and thomsonite in leucite-tephrite at Schichtberg. L. J. S.

KAŠPAR (Jan Václav). *Mineralogie kladenských uhelných slojí*. (Mineralogy of the coal measures of Kladno.) Knihovna Státního Geologického Ústavu Československé Republiky, 1939, vol. 20, 103 pp., 45 figs. English summary 6 pp.

A comprehensive account is given of the minerals of the Kladno coal basin [M.A. 3-122; 4-517; 5-189, 476; 6-356]. Most attention has been given to the sulphides: galena, blende, pyrrhotine, millerite, beyrichite, pyrite, marcasite, chalcopyrite, mispickel, and linnaeite. The normal succession is: chalybite, ankerite, dolomite—baryte—sulphide—whewellite—nacreite—calcite—secondary zaraitite, malachite, hydrous sulphates. This paragenesis is fairly regular in the fissures in the coal itself and the clay-ironstone concretions, but is less regular in the adjoining rocks. Sulphides may be contemporaneous or even earlier than baryte; e.g. fine needles of millerite enclosed in large crystals of baryte. The normal succession of the sulphides is: millerite—blende, chalcopyrite—linnaeite. Regular intergrowths (epitaxy) of two sulphides are frequent.

axis of millerite may be parallel to a diad or tetrad axis of linnaeite, triad or tetrad axis of blende or pyrite, and to the triad axis of . Blende and pyrite are intergrown with one tetrad axis parallel to the two others in diagonal position. Blende and chalcopyrite form interstitial growths. Chalcopyrite crystals are bisphenoidal ($p p, c$) or bipyramidal in habit; in the latter z predominating, with $c n a$ and new forms (10.5.15.2)?). Pyrite shows the forms $o e a p n s \Sigma$ (Dana's letters). Marcasite is bipyramidal, with $v r s$, new B (027), and uncertain (029), (015), (016). Dolomite gave a predominating new form H (8.6.14.3) with $r f$; chalcopyrite crystals gave r and (10.5.15.2)?; and some of the crystals are based on r . For baryte 70 different combinations are recorded, and crystal-forms (5.12.0), (5.13.0), (8.16.5), (7.14.8), (5.10.12), (3.21.7). Detailed statistics are also given of the forms and combinations on millerite. The paragenesis is compared with that of other coal-fields, especially those in Moravia and Wales. The accumulation of the rarer minerals is attributed to biochemical processes. F. S.

TOKODY (László). *Adatok Luciabánya és Jászómindszent ásványainak leírásához*.—TOKODY (L.). *Beiträge zur Kenntnis der Mineralien von Luciabánya und Jászómindszent (Komitat Abauj-Torna)*. *Földtani Közlöny*, Budapest, 1937, vol. 67, pp. 64–75 (Hungarian), pp. 76–77 (German), 1 pl., 2 text-figs.

Luciabánya.—Blende grown in chalybite shows the forms $a d h$ (Dana's letters) and (211)? with d predominating. Covellite as thin indigo-blue plates. Chalcopyrite as pyramidal crystals with predominating z and forms $m h e p p$, (704), (705), (403), (907), and (706); also as crystals of sphenoidal habit. Malachite, as small spheres, derived from chalcopyrite, tetrahedrite, and covellite. Jászómindszent.—Chalybite encloses haematite, and both of these enclose minute cubes of pyrite. Haematite has been derived from magnetite; and part of the chalybite has been transformed by pyrometamorphism to red iron-ore. The mode of deposition is: pyrite, magnetite, haematite, chalybite.

V. Z.

V. Z. (Viktor). *Újabb magyarországi ásványelőfordulások*. [Newer mineral occurrences in Hungary.] *A Szent István Akadémia Értésítője* [Report of the Saint Stephen Academy], Budapest, 1938, vol. 12 (for 1937), pp. 33–37.

A preliminary note on vivianite, tetrahedrite (partly freibergite), and wolframite [M.A. 5–379] from Kisbánya, com. Szatmár, and on wolframite

and fluorite from Erzsébetbánya (formerly Oláh-Láposbánya), co Szolnok-Doboka. The latter is the second known locality for wolfram in Hungary; terminated crystals are chisel-shaped with (102). V. Z.

[ПОПОВ (S. P.)] Попов (С. П.). Минералогия Крыма.—*The mineralogy of Crimea*. Moscow & Leningrad (Acad. Sci.), 1938, 352 pp. 81. Price 32r. 75 k. (bound 25r.)

Except for the second title-page in English, this volume is entirely Russian. The first part gives a general account of the history, geology and geochemistry of the region with sketch-maps; and the main systematic part gives detailed accounts of the characters and occurrence of a large number of mineral species. A detailed bibliography is added.

L. J. S.

AUBERT DE LA RÛE (Edgar). *Contribution à l'étude minéralogique de la côte française des Somalis*. Compt. Rend. Acad. Sci. Paris, 1939, vol. 208, pp. 291–293.

Besides gypsum, rock-salt, and magnetite there occur in the rhyolite and/or basalts the zeolites analcime, stilbite, heulandite, and natrolite; also colourless transparent calcite, agate and chalcedony (sometimes accompanied by opal), amethyst, and variously coloured jasper. In the neighbourhood of fumaroles emitting steam at 100° kalinite was found. The basalt and altered breccias of the Orosei valley are impregnated with chalcocite, covellite, and chrysocolla, the rock in its richest part containing 8.8% Cu and $\frac{1}{2}$ g./t. of Au. Psilomelane and polianite occur on the southern slopes of Mt. Boura.

C. A. S.

GEVERS (T. W.), PARTRIDGE (F. C.), & JOUBERT (G. K.). *The pegmatite area south of the Orange River in Namaqualand*. With accompanying geological map. Mem. Geol. Survey, South Africa, 1937, no. 172 pp., 16 pls., 5 text-figs. Price 7s. 6d. (including map).

The pegmatites described occur in a strip of sparsely populated country, about 10 miles wide, running E.-W. just south of the Orange River between Goodhouse and Vioolsdrift. The largest pegmatites reach a length of a mile and width of 50 yards. They generally run NW.-SE. across the general trend of outcrops which is E.-W., and mostly occur in a variety of black-weathering contact-rocks invaded by the granitic batholith of Namaqualand. Owing to the highly dissected nature of the topography, exposures occur through a vertical range of 2000 feet.

pal replacement processes demonstrated are muscovitization, albitization, and lithianization. Details are given of the occurrence of bismuth, arsen and highly quartzose pegmatites, of beryl and of scheelite in the tourmaline veins. Accurate mineralogical data are given for the principal minerals, but practically no crystallographic details, while information on chemical properties is largely based on spectroscopic examination: beryl, chrysoberyl, phenakite, bertrandite, spessartine, columbite-columbite, euxenite, monazite, xenotime, uranophane, soddyite, zircon near pyrochlore, tourmaline, rutile, albite, muscovite, spodumene, lepidolite, lithiophilite, bismuth, bismuthinite, bismoclite, sphene, chlorite, zoisite, prehnite, epidote, apatite, and scheelite. Non-pegmatitic mineral deposits briefly described are copper ores, pyroxene, and tremolite. Chemical analyses are given for spessartine and columbite-columbite and part-analyses for uranophane, and the mineral pyrochlore. The map is on the scale of 1 : 100,000 and represents an area of about 45 × 35 miles.

E. D. M.

BRIDGES (T. W.). *Phases of mineralization in Namaqualand pegmatites*. Trans. Geol. Soc. South Africa, 1937, vol. 39 (for 1936), pp. 331-377, pls.

This is largely a reprint of the same author's contributions to the *Geological Memoir* (see preceding abstract); whole paragraphs and even sentences are almost identical.

E. D. M.

BRIDGES (F. C.). *A contribution to the mineralogy of the Potgietersrusch fields*. Trans. Geol. Soc. South Africa, 1937, vol. 39 (for 1936), pp. 461-464.

A mineral previously described as orthite is probably bastnäsite. Arsenolite (in small quantity), arsenolite and scorodite (alteration products of mispickel), and tennantite and enargite (identified only in thin sections) are mentioned for the first time from this locality.

E. D. M.

BRIDGES (George). *The paragenesis of the Center Strafford, New Hampshire, pegmatite*. Amer. Min., 1938, vol. 23, pp. 811-820, 1 fig.

Description of the minerals and their paragenesis from the lenticular pegmatite, which is quarried for mica and feldspar. The occurrence, noted

for unusual phosphate minerals, has yielded a mass of brown triphylite 10 feet across. Chemical analysis of optically determined cleavage fragments, α 1.686, β 1.687, γ 1.693, $2V$ 20° , positive, yields P_2O_5 44. FeO 29.13, MnO 15.96, MgO 0.42, CaO 0.31, Li_2O 8.86, Na_2O 0. K₂O 0.07, H₂O 0.48, insol. 0.21, total 100.46. Prismatic crystals, up to 5 cm. in length, of tin-white löllingite, forms m (110), l (011), z (012), c (001), yields Fe 27.89, As 70.94, S 0.96, total 99.79. F. A. B.

SIMPSON (E. S.). *Contributions to the mineralogy of Western Australia Series XI*. Journ. Roy. Soc. W. Australia, 1938, vol. 24 (for 1938), pp. 107–122, 5 figs. [Cf. M.A. 7–113.]

(1) Anauxite, Ravensthorpe, SW. Division.—A friable creamy-white mass of pearly scales, H. 1, from the alteration of biotite: anal. I (after deducting 16.86% quartz and 4.09% rutile) shows no excess of silica over the ratio $R_2O_3 : SiO_2 = 1 : 2$ [M.A. 7–95]. (2) Axinite, Weld Range, Murchison Division.—Grey crystals (*M s r b f*) and massive axinite found with quartz a vein in amphibolite; sp.gr. 3.26, α 1.677, γ 1.685, anal. (3) Beidellite, Bangemall, NW. Div.—Ochre-yellow crusts, sp.gr. 2.71, n 1.544, on auriferous quartz gave anal. III; $H_8Mg(Al,Fe)_4Si_6O_{23} \cdot 4H_2O \cdot 0.14(Na,K)_2O$. (4) Beudantite and plumbojarosite, Mt. McGraw, NW. Div.—Analysis of micro-granular (minute crystals *r c*) of yellow material from the Belvedere gold and lead mine points to a mixture of beudantite, plumbojarosite, and jarosite. (5) Calciosamarite, Hillside, Pilbara, NW. Div.—Pebbles with brownish-black fracture gave $Nb_2O_5 + Ta_2O_5$ 58.3, Yt_2O_3 (+ little Ce_2O_3) 16.5, FeO 3.5, MnO 0.5, CaO 6.0, UO_3 (+ traces BeO, UO_2) 8.0, PbO 2.0, TiO_2 1.0, SnO_2 2.6, loss 2.0 = 100.9; sp.gr. 5.60. (6) Chrysotile and antigorite, Meilga, NW. Div.—Veins of fine quality white to yellow chrysotile (sp.gr. 2.37, anal. IV) occur in a zone of pale cream waxy antigorite (sp.gr. 2.48 anal. V) at the contact of dolerite dikes with dolomite. (7) Cordierite and anthophyllite, Clackline, SW. Div.—Analysis (SiO_2 52.66, Al_2O_3 13.1, MgO 20.20, &c.) is given of a gneissic rock composed mainly of cordierite and anthophyllite, occurring as a small laccolite in schists. (8) Fayalite and hedenbergite, Burges gold find, Burracoppin, SW. Div.—Analysis (SiO_2 40.18, Fe_2O_3 6.34, FeO 27.38, &c.) of a fayalite-gabbro with hedenbergite. (9) Petalite, Londonderry, Central Div. [M.A. 5–4] —Large masses with cleavages (or partings) *c a o z* as veins in pegmatite; anal. VI, sp.gr. 2.42, of clear colourless material suitable for cutting gemstones; four analyses are also given of alteration products. (10) Spodumene, McPhees Range, NW. Div.—Large masses, in part altered

scaly muscovite, in pegmatite quarried for tantalum minerals;
WII.

O ₂ .	Al ₂ O ₃	Fe ₂ O ₃	MnO.	MgO.	CaO.	Na ₂ O.	K ₂ O.	H ₂ O+.	H ₂ O-.	Total.
30.90	33.00	3.00	nil	0.69	0.10	1.72	0.20	17.38	2.58	99.57
32.42	17.46	1.47	3.01	1.50	20.09	nil	nil	1.93	—	100.75
35.92	22.02	7.53	—	5.15	trace	0.60	0.80	10.23	8.17	100.42
34.93	0.23	trace	0.05	41.99	0.03	nil	nil	13.47	1.17	100.64
34.95	0.29	trace	0.06	42.76	nil	nil	nil	13.81	0.87	100.16
35.68	16.62	0.09	*	nil	nil	0.08	nil	0.01	nil	99.834
38.83	27.34	0.15	†	nil	0.22	0.44	0.22	0.18	0.06	99.76

also B₂O₃ 6.07, FeO 6.68, TiO₂ 0.12. IV, also FeO 0.43, CO₂ 1.34. V, also FeO 0.34, TiO₂ 0.01, P₂O₅ 0.07. VI, also * Mn₂O₃ 0.004, Li₂O 4.13, BeO trace. VII, also † Mn₂O₃ 0.08, Li₂O 7.08, CO₂ 0.10, P₂O₅ 0.06.

L. J. S.

Radioactivity.

FER (A. Keith). *Radioactivity of potassium and geological time.* Science, New York, 1937, vol. 86, pp. 198–199.

The known abundance and half-life period of the radioactive isotope potassium (⁴⁰K) indicate an upper limit to the age of the earth of about 4.5⁹ years, and a probable date of solidification of the earth's crust of 1.4 × 10⁹ years ago. It is suggested that the greater abundance of potassium in the Carboniferous era may have some connexion with the marked increase of vegetal activity at that period.

M. H. H.

WIL (Norman B.). *The calculation of geological age.* Amer. Journ. Sci., 1939, vol. 237, pp. 195–214, 4 figs.

A series of new equations for calculating the ages of rocks and minerals from radioactive data, as given by the content of Pb, He, Th, U, AcU, and Ra.

L. J. S.

ПОЛКАНОВ (А. А.)] Полканов (А. А.). Основные черты геологии восточной части Фенноскандии-Кольского полуострова и Карелии и очередные проблемы геохронологии по радиоактивному распаду.

—POLKANOV (A. A.). *Geological outline of the eastern part of Fenno-skandia-Kola peninsula and Carelia and the actual geochronologic problems on the radioactive desintegration.* Академику В. И. Вернадскому к пятидесятилетию научной и педагогической деятельности. Акад. Наук СССР [Vernadsky jubilee volume, Acad. Sci. USSR.], 1936, vol. 1, pp. 421–444, 1 fig. (Russian with English summary.)

A review of the classification of rocks is given together with a critical determination of their relative ages. Fossil plants of Upper Devonian—Lower Carboniferous age in hornfels inclusions in the alkalic rocks of the Kola zero tundra provide the lower age-limit to the alkalic rocks of the eastern part of Kola peninsula. On the other hand, the determination

of their age by the radioactive method carried out by V. G. Khlop gives 300–350 million years. S. I. T.

PIGGOT (Charles Snowden). *Radium in rocks: V. The radium content the four groups of pre-Cambrian granites of Finland.* Amer. Journ. Sci., 1938, ser. 5, vol. 35A, pp. 227–229.

The amount of radium varies from 0.63 to 5.51×10^{-12} gram per gram of rock, with wide variations in different samples of the same type granite. L. J. S.

BARTH (Tom. F. W.). *Radium and the petrology of certain granites Finland.* Amer. Journ. Sci., 1938, ser. 5, vol. 35A, pp. 231–244 4 figs.

No relation is found between Ra and K or FeO, but for granites of the same type Ra is correlated with the amount of biotite. L. J. S.

DUBEY (V. S.) & BAJPAI (M. P.). *Radioactivity of the Deccan trap Part I, basalts.* Amer. Journ. Sci., 1937, ser. 5, vol. 34, pp. 24–34.

As determined by the solution method (in HF + H₂SO₄) these basalts contain on an average Ra 0.56×10^{-12} gram per gram and Th 0.59×10^{-12} gram per gram, with little variation in successive flows. The results are rather lower for Ra and higher for Th than those obtained by the fusion method by Poole and Joly (1924). These rocks are richer in Ra and Th than older rocks of similar character. L. J. S.

BAKKEN (Ruth) & GLEDITSCH (Ellen). *Analyse av en enkeltkrystall av cleveit fra Aust-Agder.* Tidsskrift for Kjemi og Bergvesen, Oslo, 1938, vol. 18, pp. 74–5.

— — — *Analyses in layers of a single crystal of cleveite, Auselmyr, Norway.* Amer. Journ. Sci., 1938, ser. 5, vol. 36, 95–106.

Micro-analyses of layers taken off parallel to the cube faces gave: I, surface yellow and red alteration product; II, outside layer; III, middle layer; IV, core. The calculated age is 1283–1308 million years. [M. 6-519.]

	UO ₂ .	UO ₃ .	ThO ₂ .	Rare- earths.	PbO.	Fe ₂ O ₃ .	SiO ₂ .	Insol.	H ₂ O.
I.		52.23	6.96	1.43	20.65	3.86	3.15	0.31	2.0
II.	45.77	33.97	3.20	2.26	12.66	0.45	—	0.24	0.2
III.	47.10	33.21	2.96	2.42	12.86	0.82	—	0.00	—
IV.	47.95	32.44	3.03	2.24	13.02	1.20	—	0.04	0.0

L. J. S.

BLE (John Putnam). *A further study on the age of Great Bear Lake pitchblende*. Amer. Min., 1937, vol. 22, pp. 564-566, 1 fig.

specimen of pitchblende showing no sign of secondary uranium minerals gave Pb 5.877, U 29.386, Th. < 0.01%, and the ratio Pb/U, indicating an 'uncorrected age' of 1368 million years.

L. J. S.

BLE (John Putnam). *The analysis of two samples of pitchblende ore from Great Bear Lake, Canada*. Amer. Min., 1939, vol. 24, pp. 272-273.

chemical analyses of two specimens of pitchblende ore containing 34.66% U_3O_8 and with specific gravities 5.95 and 3.70 respectively are given. The former specimen is identical with material used by numerous workers on radioactivity and isotopes.

F. A. B.

SEASON (Earl). *Uraninite and associated minerals from Haddam Neck, Connecticut*. Amer. Min., 1938, vol. 23, pp. 269-276, 6 figs.

uraninite was found in a single cavity in one of the felspar quarries. X-ray photograph gave a 5.454 Å., and the lead ratio an age of 280-million years. Associated minerals are columbite, autunite, torberite &c.

L. J. S.

SEASON (B. M.). *The occurrence, crystal habit and composition of the uraninite from the Ruggles mine, near Grafton Center, New Hampshire*. Amer. Min., 1938, vol. 23, pp. 334-341, 5 figs.

drusitic growths and small crystals (a 0 with new (533), or rarely d) in pegmatite. Micro-analysis by F. Hecht, U_3O_8 90.06, ThO_2 0.43, Fe_2O_3 0.21, PbO 3.63, SiO_2 0.80, Al_2O_3 0.44, Fe_2O_3 0.66, MnO 0.09, CaO 0.81, P_2O_5 0.16, S 0.04, $H_2O +$ 1.74, $H_2O -$ 0.73, insol. = 100.51, gives the Pb/U ratio 0.041, corresponding with an age of 280 million years (late Devonian).

L. J. S.

SEASON (O. B.). *The determination of uranium, thorium, and lead in thucholite*. Journ. Amer. Chem. Soc., 1937, vol. 59, pt. 2, pp. 2269-2270.

modular material from Henvey, Ontario [M.A. 4-11, 502], gave U 4.63, ThO_2 90.3, Pb 0.186%. Cubic crystals (evidently pseudomorphous after uraninite) gave U 1.22 (1.26), Th 4.51 (3.91), Pb not determined. Approximate age 278 million years.

L. J. S.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 2661-2662.

A record of massive flow breccias, New Mexico, given by Alvarez, 1938, p. 2662, has an $^{40}\text{Ar}/^{39}\text{Ar}$ less or greater than $^{40}\text{Ar}/^{39}\text{Ar}$, indicating age of 888 million years. L. J. S.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 116-122.

Massive series of breccias, together with a massive sequence of fine grained breccias having typical, occur in various in progressive series. All are strongly brecciated in character. L. J. S.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 448-450.

The breccias in the bodies of certain dikes in the mass of Alameda are composed of a mass of breccias, though each crystal is a mass surrounded by a mass. The breccias are of two sorts, most a breccia, showing the local element of the breccia family in the mass. A smaller breccia is also used to put a mass of the breccia family. The breccias are unchanged in looking up to 100% in quality described at 100%. Their presence implies great age of the breccia containing the breccia, which is the breccia family. [M.A. 7-192.] C. A. S.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 415-420, 1 pl.

The breccia family is only in the surface and in the breccia family of the breccia family (M.A. 14-48) which are composed of the breccia family and breccia. The breccia family is composed of breccia family and breccia family, which is the breccia family. L. J. S.

Zeolites.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 447-450, 6 figs.

Alvarez, P. B. *Yosemite*. Amer. Mus. Natur. Hist. Trans. Ser., 1938, vol. 60, pp. 447-450, 6 figs.

0.15, Na_2O 1.1, K_2O 1.55, H_2O 21.7, total 100.2) was treated with solutions of NaCl , KCl , BaCl_2 , SrCl_2 , CdCl_2 , MgCl_2 , LaCl_3 , and CaCl_2 ; but complete base-exchange was obtained in 200 hours at 100°C . With the first three salts, partial exchange with SrCl_2 and CdCl_2 , and very little with MgCl_2 and LaCl_3 ; CaCl_2 treatment did not replace the small amount of alkali in the original material. The absorption of H_2 at 0°C ., N_2 at -190° and -80°C ., CO_2 at 20°C ., and propylene at 0°C ., by each of the five base-exchange products and by the original zeolite (in each case after dehydration at 500°C .) were studied. The results are discussed in relation to the author's formula for the dissociation pressures of zeolitic solids [M.A. 5-355] and the formula is modified to cover the two extreme cases of completely mobile sorbate ('sponge sorbate') and completely fixed sorbate (definite lattice positions), with or without allowance for vibration of the sorbate molecules. The results obtained with chabazite and its base-exchange products are not sufficient to decide between the two formulae or to evaluate the constants in either, but the apparent saturation values obtained suggest that the theory of definite lattice positions is incorrect. The dissociation pressure formula derived by M. H. Hey [Min. Mag. 24-99] is adversely affected. [Cf. M.A. 6-127].

M. H. H.

HEY (Richard M.). *The sorption of polar and non-polar gases by zeolites*. Proc. Roy. Soc. London, Ser. A, 1938, vol. 167, pp. 392-420, 13 figs.

The absorption and heats of sorption of hydrogen, nitrogen, argon, methane, and ammonia by dehydrated chabazite, analcime, natrolite, heulandite, and heulandite have been studied. The first four gases were adsorbed only by chabazite and analcime, the failure of the other zeolites to adsorb being ascribed to collapse of the lattice channels. Saturation values varied with temperature, and were not integral. Ammonia on chabazite gave an invariant system, interpreted as a definite ammoniate: chabazite, analcime, and heulandite, ammonia gave simple sorption with a saturation value varying with the temperature. The rate of sorption of ammonia by analcime, heulandite, and natrolite was studied, the results differing considerably from those of A. Tiselius [M.A. 6-524]. [In a private communication, the author notes that he used an incorrect formula for analcime (24 instead of $16\text{H}_2\text{O}$) and the theoretical saturation values should be reduced by $1/3$.]

M. H. H.

CAILLÈRE (Simonne). *Sur un mode spécial d'altération de l'anorthite une variété calcique de thomsonite*. Compt. Rend. Acad. Sci. Paris, 1937, vol. 204, pp. 785-786.

In a serpentinized peridotite from Ras-Bassit, Syria, occur veins of massive pseudomorphous mineral consisting of anorthite (n 1.58) altered into thomsonite (n 1.51); a bulk analysis of the mixture is given.

M. H. H.

MILLIGAN (W. O.) & WEISER (Harry B.). *The mechanism of the dehydration of zeolites*. Journ. Physical Chem., 1937, vol. 41, pp. 1037-1040, 8 figs.

Isobaric dehydration curves at a single water-vapour pressure and X-ray powder photographs lead to the following conclusions: scolecite forms two definite hydrates, $\text{CaAl}_2\text{Si}_3\text{O}_{10}$ with $2\text{H}_2\text{O}$ and $3\text{H}_2\text{O}$; the latter breaks down completely when dehydration is complete (400°C). Stillbite gives a continuous dehydration curve showing a marked change in X-ray powder pattern about 120°C . at 23 mm. Hg of water-vapour and when the dehydration of this new phase is reversible, reconversion to the natural phase is not possible. Heulandite behaves very similarly to stillbite except that there is also a reversible break in the isobar and change in the X-ray patterns at 100 – 120°C . Thomsonite gave a continuous reversible dehydration curve and a slight lattice contraction, as did analcime and chabazite, but the analcime dehydration was not wholly reversible. Natrolite is a dihydrate, which at about 160 – 180°C . gives a monohydrate, with a slight but definite change in X-ray pattern, and at about 250°C . becomes anhydrous with lattice breakdown. Mesolite is 'a solid solution of varying amounts of scolecite and natrolite'. The zeolites which are not regarded as definite hydrates are regarded as holding water bound by adsorptive forces within channels in the lattice.

M. H. H.

SEKANINA (J.) & WYART (J.). *Sur l'harmotome*. Bull. Soc. Franç. Min., 1937, vol. 60, pp. 139-145, 3 figs.

Harmotome from Strontian, Scotland, gave sp.gr. 2.450 and a unit cell a 9.80, b 14.10, c 8.60 Å., β $55^\circ 10'$; space-group C_{2h}^{22} or C_2^2 . The unit cell contains $\text{Ba}_2\text{Al}_4\text{Si}_{12}\text{O}_{32} \cdot 12\text{H}_2\text{O}$, and the mineral shows closer relationship to heulandite than to stilbite [M.A. 6-523].

L. J. S.

BERT (J.) & CHATELAIN (P.). *Étude cristallographique de la christianite*. Bull. Soc. Franç. Min., 1938, vol. 61, pp. 121–126.

Phillipsite from Richmond, Australia, gave a 10.00, b 14.25, c 8.62 Å. $a:b:c = 0.702:1:0.605$, $\beta = 54^\circ 20'$; space-group C_{2h}^2 or C_2^2 ; sp.gr. 14. Published analyses of phillipsite are tabulated. The unit cell contains $K_2Ca_2Al_6Si_{10}O_{32} \cdot 12H_2O$. As with harmotome, the structure is based on a framework of $(Al,Si)_{16}O_{32}$. L. J. S.

BECH (J. E.). *Natrolith and Epinatrolith*. Min. Petr. Mitt. (Tschernak), 1937, vol. 49, pp. 459–460.

Reasons are given for regarding epinatrolite (S. J. Thugutt, 1911) [Mag. 23–245; M.A. 5–163] to be identical with natrolite. L. J. S.

BEK (Karel). *Dva zajímavé typy phillipsitu z čedičů v severovýchodních Čechách*.—Two interesting types of phillipsite from the basalts of N-E. Bohemia. Sborník Národního Musea v Praze (Acta Musei Nationalis Pragae), 1938, vol. 1 B, pp. 85–90, 3 figs. (English with Czech summary.)

Phillipsite occurs in dikes and necks of basalt near Nová Paka in Bohemia. At Kumburk Hill it forms 3–4 mm. twinned crystals of rare pseudo-octahedral type, which are transparent outside and clear and opaque inside. At Stupná small crystals ($a b m$) are intersecting cross-twins on (001); n 1.49, sp.gr. 2.28. F. S.

BÁTS (Tibor). *A zsidóvári granodiorit*. [Granodiorite from Zsidóvár.] Mat. Term.-tud. Értesítő, Budapest, 1936, vol. 54, pp. 882–892, 2 figs.

Fractures in the granodiorite at Zsidóvár, com. Krassó-Szörény, contain the following minerals. Smoky-quartz, amethyst, pale-rose orthoclase, adularia, albite, sphene (2–3 mm. yellowish-brown crystals, $Y m$, twinned on c), calcite, laumontite (white or colourless prismatic crystals, 12 mm. long; anal. I), stilbite (sheaves of brownish-yellow crystals, $c m b$, up to 15 mm.; anal. II), fluorite, and epidote. A dehydration curve is given for the stilbite.

SiO ₂ .	Al ₂ O ₃ .	Fe ₂ O ₃ .	CaO.	SrO.	MgO.	Na ₂ O.	K ₂ O.	H ₂ O+.	H ₂ O—.
52.24	22.14	—	10.55	—	trace	0.31	0.43	15.14	
55.95	16.72	0.32	7.74	0.01	—	0.78	—	17.06	1.67

V. Z.

MAURITZ (Béla) & HARWOOD (H. F.). *A Tátika-csoport bazaltos kőzet*
[The basalt rocks of the Tátika group.] Mat. Term.-tud. Értesít.
Budapest, 1936, vol. 55, pp. 75–103, 1 pl.

MAURITZ (B.) & HARWOOD (H. F.). *Die basaltischen Gesteine der Tátika-
gruppe im Plattenseegebiet (Ungarn)*. Min. Petr. Mitt. (Tschernaberg)
1937, vol. 48, pp. 373–401, 6 figs.

A description with six new chemical analyses (23 constituents) given of the basalts at Tátika near Lake Balaton. Zeolites (phillipsite, analcime, and natrolite), present in fissures and in the groundmass, are considered to be derived from the feldspars during the last stage of the consolidation of the rock.

V. Z.

ROSSONI (P.). *La laumontite de Val di Perga (Castellina Marittima)*. Atti (Proc. Verb.) Soc. Toscana Sci. Nat., 1935, vol. 44, pp. 88–92, 2 figs.

Laumontite occurs with calcite in veins in diabase at this locality prov. Pisa. Extinction-angle 8° on the (110) cleavage, $2V\ 40^\circ$. Analysis (deducting 5.18% calcite) gave SiO_2 49.55, Al_2O_3 21.85, MgO 0.06, CaO 9.46, Na_2O 3.84, K_2O 0.77, H_2O 14.47. The dehydration curve shows gradual loss of water up to 900°C . Formula, $(\text{Ca}, \text{Na}_2)_2\text{Al}_4(\text{SiO}_3)_8 \cdot 8\text{H}_2\text{O}$.

L. J. S.

SANERO (Edoardo). *Stilbite nella tonalite di Val Nambrone (gruppo dell'Adamello)*. Periodico Min. Roma, 1938, vol. 9, pp. 205–212, 1 fig.

Small twinned crystals lining druses have the forms $b\ c\ m\ f$ [Dana] sp. gr. 2.159, α 1.492, β 1.499, γ 1.501, $2V\ 32^\circ 25'$; SiO_2 55.21, Al_2O_3 16.9, Fe_2O_3 trace, CaO 8.10, MgO 0.25, Na_2O 1.16, K_2O 0.45, H_2O 18.27–100.35.

L. J. S.

SCHERILLO (Antonio). *Su alcune zeoliti dell'Eritrea*. Periodico Min. Roma, 1938, vol. 9, pp. 61–69, 1 fig.

The zeolites occur with calcite in much weathered basalts. From Asmara come chabazite, thomsonite, and stilbite (sp. gr. 2.166, α 1.49, γ 1.502). From Alomatà: I, stilbite, $(\text{Ca}, \text{Na}_2)\text{Al}_2(\text{Si}_3\text{O}_8)_2 \cdot 6\text{H}_2\text{O}$, α 1.48, γ 1.488; II, scolecite, $(\text{Ca}, \text{Na}_2)\text{Al}_2(\text{Si}_3\text{O}_{10}) \cdot 3\text{H}_2\text{O}$, α 1.510, β 1.51, γ 1.517. Dehydration curves are given for stilbite and scolecite.

	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	H_2O	Total	Sp. gr.
I.	56.80	15.83	trace	0.10	7.95	0.55	0.06	18.61	99.90	2.14
II.	45.59	26.25	„	0.19	14.10	0.33	0.04	13.99	100.49	2.27

L. J. S.

HEVIN (Eug.). *Thomsonite from the eastern townships, Quebec*. Univ. Toronto Studies, Geol. Ser., 1937, no. 40, pp. 63-65, 1 fig.

Thomsonite occurs in aplite dikes associated with albite and grossular at the Caribou chrome pit, and with diopside and in some cases calcite at several asbestos pits at Thetford Mines. Crystals from the Johnston asbestos pit are subparallel growths, showing a , b , and c faces only. Refractive indices α 1.528, β 1.530, γ 1.541, $2V$ 50° , positive, $Bx_a \perp (001)$, $bl. (010)$. [In the absence of any faces other than a , b , and c or any other work, this orientation is arbitrary, and it is not that normally adopted.] Analysis by R. J. C. Fabry gave SiO_2 38.10, Al_2O_3 28.98, Fe_2O_3 2.26, MgO 0.38, CaO 13.61, Na_2O 5.28, K_2O 0.22, H_2O 12.76, total 99.71; $d_{100} = 9.62$.
M. H. H.

HEVIN (Eugene). *Natrolite from the eastern townships, Quebec*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 57-58.

Enormous crystals (almost 3 feet long and 4 inches across) of natrolite occur in aplite dikes in Johnston asbestos mine. Sp. gr. 2.20-2.26, $d_{100} = 9.62$, β 1.479, γ 1.490. Analysis by R. J. C. Fabry gave SiO_2 46.53, Al_2O_3 26.63, Fe_2O_3 1.34, MgO 0.12, CaO 0.44, Na_2O 15.53, K_2O 0.44, $d_{100} = 9.62 = 100.65$.
L. J. S.

WENELL (G. M.). *Zeolites at the Sherritt Gordon mine*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 19-22, 1 pl.

A vein of massive sulphide ore (pyrrhotine, pyrite, chalcopyrite, and galena) in gneiss cut by granite is worked in this mine in northern Manitoba. Cavities in the hanging wall between the gneiss and the ore in the gneiss are lined with natrolite (α 1.477, β 1.481, γ 1.490), analcime (sp. gr. 2.253, n 1.486), and chabazite (n 1.485), with some albite and secondary pyrite. The presence of zeolites is assumed to indicate low-temperature hypogene conditions, whilst other features of the ore-deposit indicate the high-temperature type.
L. J. S.

EDHAM (C. E.). *Zeolites in New Mexico*. Amer. Min., 1938, vol. 23, pp. 285-287.

Thomsonite (α 1.517, β 1.519, γ 1.528, $2V$ 55°) and analcime have been found in andesite at two localities near Socorro.
L. J. S.

ROBERTS-SMITH (T.). *Zeolites*. Australian Mus. Mag., 1938, vol. 6, pp. 305-308, 3 figs.

A popular article outlining the formation of zeolites by the action of

ADA (Zyunpéi). *Beiträge zur Kenntnis der optischen und chemischen Eigenschaften des Apatits von Kurokura, Kanagawa Präfektur.* Journ. Fac. Sci. Hokkaido Univ. Sapporo, Ser. 4, 1938, vol. pp. 11–116, 2 figs.

apatite crystals (*c m a x*) from cavities in quartz-diorite are greenish-white inside (ω 1.658, ϵ 1.653) with a white opaque shell (ω 1.640, ϵ 1.635). They are encrusted with zeolites and chlorite, and the white color is believed to be due to hydrothermal alteration. Analyses by Kurokura gave I for the inner portion and II for the outer. I agrees with the apatite formula, $9\text{CaO} \cdot 3\text{P}_2\text{O}_5 \cdot \text{Ca}(\text{F}, \text{Cl})_2$, but in II there is a deficiency of (F, Cl, OH).

P_2O_5 .	CaO.	Fe_2O_3 .	FeO.	MnO.	MgO.	$\text{H}_2\text{O}+$.	Cl.	F.	Total.
40.98	52.40	—	0.21	1.52	0.54	0.06	3.74	1.15	100.60
41.78	53.85	0.61	—	0.41	0.54	0.10	1.42	0.44	99.15

L. J. S.

DUNCAN (Duncan). *The problem of the carbonate-apatites; a carbonate apatite (dahllite).* Amer. Journ. Sci., 1938, ser. 5, vol. 36, pp. 296–303. Correction, Amer. Min., 1938, vol. 23, p. 606.

radially fibrous dahllite (n 1.619–1.628, sp. gr. 2.93, a 9.41, c 6.88 Å.) from Mouillac, France [M.A. 7–88], gave P_2O_5 38.57, SO_3 0.05, SiO_2 0.40, CO_2 0.44, CaO 53.16, Na_2O 0.77, K_2O 0.28, F 0.19, $\text{H}_2\text{O}(+300^\circ)$ 0.51 (0.50), $\text{H}_2\text{O}(110-300^\circ)$ 0.21 (0.50), $\text{H}_2\text{O}(-110^\circ)$ 0.61, Fe_2O_3 0.34 = 99.88. Neglecting water below 300°C . and H_2O , this is interpreted as



[M.A. 6–430; 7–14, 88; Min. Mag. 25–138, 395.]

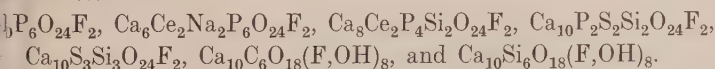
L. J. S.

BORNEMAN-STARYNKEVICH] BORNEMAN-STARYNKEVICH (I. D.). *On some isomorphic substitutions in apatite.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1938, vol. 19, pp. 253–255.

DUNCAN (Duncan). *Isomorphic substitutions in apatite.* Ibid., 1939, vol. 22, pp. 87–88.

NOV (N. V.). *On some isomorphic substitutions in the apatite group.* Ibid., 1939, vol. 22, pp. 89–92, 5 figs.

It is held that apatite analyses may be interpreted in terms of end-molecules



The substitution of carbon for calcium is unlikely, and a francolite the analysis of which shows too much CO_2 and H_2O to be represented by the

above end-molecules probably contains an aqueous solution of carbonic acid in the pores of the crystal. In the apatite of Hastings Co., Ontario analysed by Dadson [M.A. 5-480], the presence of 0.83% rare-earth has been overlooked. Analyses are given of apatites bearing strontium and rare-earths from Takhtarvumtchorr and Kukisvumtchorr, Khibiny tundra, and of a sulphate- and silicate-bearing apatite from Shishikminsk mines, Urals.

(2) The possibility of the substitution of carbon for calcium in the apatite structure is upheld: the carbon replacing phosphorus occurs in CO_4 -groups, to which no definite charge can be assigned; they may well be $\text{C}(\text{O},\text{OH})_4$ groups.

(3) Analysis of the apatite structure shows that the substitution of phosphorus by carbon is highly probable; although the carbon so substituting will be surrounded by four oxygen atoms, their distances are not equal, one being more distant than the other three, and the substitution may be regarded as a replacement of PO_4''' by $\text{CO}_3'' + \text{OH}'$. Substitution of calcium by carbon is as yet unproved, the data being inconclusive; structurally, a replacement of Ca by C is only probable so far as those calcium atoms which lie on the threefold axes are concerned, and a partial replacement of these in the ratio C for Ca is improbable. A replacement in the ratio C for 2Ca is possible, but unproved. M. H. H.

THEWLIS (J.), GLOCK (G. E.), & MURRAY (M. M.). *Chemical and X-ray analysis of dental, mineral and synthetic apatites*. Trans. Faraday Soc., 1939, vol. 35, pp. 358-363, 1 pl.

Chemical analyses and X-ray data are given for two fluor-apatites, two staffelites, quercylite, osteolite, podolite, francolite, synthetic chlor-, hydroxy-, and Ca-Mg-hydroxy-apatites, human and canine dental enamel. The view that carbon can enter the apatite structure either as CO_3'' groups or in replacement of P and Ca, is rejected and it is suggested that CO_2 shown in apatite analyses represents contamination by calcite or some other carbonate mineral. No correlation between composition and cell-sides could be traced. Dental enamel is essentially a hydroxy-apatite. M. H. H.

[BOROVIK (S. A.) & ПРОКОПЕНКО (N. M.)] Боровик (С. А.) и Прокопченко (Н. М.). Германий в некоторых сульфидных рудах СССР. BOROVIK (S. A.) and PROKOPENKO (N. M.). *Germanium in sulphide ores of the USSR*. Изв. Акад. Наук СССР, Отд. Мат. Ест., 1940, 1, 1-10.

ГЕОЛ. (Bull. Acad. Sci. URSS, Cl. Math. Nat., Sér. Géol.), 1938, pp. 341–347. (Russian with English summary.)

Spectrographic tests for germanium made on 92 samples of sulphide minerals from different parts of the USSR show that germanium is present mainly in the light-coloured low-temperature zinc-blende, which is usually poor in indium.

S. I. T.

RODY (L.). *Quarz von Felsöbánya (= Baia Sprie)*. Zeits. Krist., 1938, vol. 99, pp. 56–60, 1 fig. [Cf. M.A. 7–160.]

At Baia Sprie, Satu Mare, Romania, two varieties of quartz were found. One consists of rounded crystals 1–1.5 mm. in diameter with rough faces, and is twinned on the Japan law forming cross-shaped twins on (11 $\bar{2}$ 2). The other consists of larger crystals rich in vicinal faces and including some on the Brazil and Dauphiné laws.

H. S.

YAMAGUCHI (Ei-ichi). *Über die photochemischen Eigenschaften des Sodaliths von Kishshu, Korea*. Zeits. Krist., 1938, vol. 99, pp. 314–325, 8 figs.

Sodalite associated with nepheline from Jiohachidō, Kishshu-gun, is a reddish mineral very similar to the rare hackmanite and arising from the decomposition of sodalite. It has unusual optical properties, showing red fluorescence, &c., which are not exhibited by dark-blue varieties of sodalite.

H. S.

WILSON (Rollin E.). *New analyses of lepidolites and their interpretation*. Amer. Min., 1938, vol. 23, pp. 607–628, 4 figs.

Seventeen new analyses of lepidolite from various localities are related on the basis that the unit cell of mica contains 48(O,OH,F) atoms. An effort is made to interpret these analyses on the basis of isomorphous mixtures between four end-members arbitrarily chosen:—polyboronite, $K_4Li_8Al_4Si_{16}O_{40}F_8$; biotite, $K_4(Mn,Fe,Mg)_{12}Al_4Si_{12}O_{40}(F,OH)_8$; hypothetical lithium-muscovite, $K_4Li_6Al_6Al_4Si_{12}O_{40}(F,OH)_8$; and phlogopite, $K_4Al_8Al_4Si_{12}O_{40}(OH,F)_8$. The 'ideal formulae' deduced for lepidolite are then:— $K_4Li_8Al_4Si_{16}O_{40}F_8$; $K_4Li_6Al_5AlSi_{15}O_{40}(F,OH)_8$; $K_4Li_7Al_5Al_2Si_{14}O_{40}(F,OH)_8$; $K_4Li_5Al_6Al_3Si_{13}O_{40}(F,OH)_8$; $K_4Li_6Al_6Al_4Si_{12}O_{40}(F,OH)_8$.

F. A. B.

WACHS (Charles). *Crystallography of meyerhofferite*. Amer. Min., 1938, vol. 23, pp. 644–648, 3 figs.

New material from the original locality has afforded numerous crystals

for goniometric, optical, and X-ray data. Meyerhofferite has been orientated so that the axes chosen by Schaller are rotated 180° about the c -axis thus transforming (111) to $(\bar{1}\bar{1}1)$. New axial ratios are $a : b : c = 0.7904 : 1 : 0.7763$, $\alpha 90^\circ 41'$, $\beta 101^\circ 51'$, $\gamma 86^\circ 44'$; and new forms $(\bar{1}\bar{1}1)$, (212), and $(\bar{2}\bar{1}2)$. The unit cell containing $\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 7\text{H}_2\text{O}$ has the dimensions $a 6.60$, $b 8.33$, $c 6.48 \text{ \AA}$. The orientation of the optical indicatrix derived by universal stage methods has been plotted on a stereographic projection; 2V 78° . F. A. B.

EMMONS (R. C.) & FRIES (Carl). *Aluminum and silicosis*. Amer. Min., 1938, vol. 23, pp. 654-660.

It is agreed that aluminium acts as a protector against silicosis, but that its protective capacity depends upon its power of flocculating colloidal silica, not upon its decreasing the solubility of silica in water. F. A. B.

SWITZER (George). *Crystallography of braunite from Nagpur, India*. Amer. Min., 1938, vol. 23, pp. 649-653, 4 figs.

Fermor's (1909) description of braunite from Nagpur is supplemented by new goniometric and X-ray measurements. A list of 32 forms and a table of angles are given; $a : c = 1 : 1.4070$. The tetragonal unit-cell dimensions, $a 13.23$, $c 18.77 \text{ \AA}$, are close to those for braunite from Långban, Sweden [M.A. 4-461]. F. A. B.

RAMDOHR (Paul). *Über Schapbachit, Matildit und den Silber- und Wismutgehalt mancher Bleiglanze*. Sitzungsber. Preuss. Akad. Wiss. Phys.-math. Kl., 1938, pp. 71-91, 6 pls., 4 text-figs. [M.A. 7-10]

LAForge (Laurence). *Crystallography of tsumebite*. Amer. Min., 1938, vol. 23, pp. 772-782, 5 figs.

Two-circle goniometer measurements of crystals of tsumebite, which are invariably twinned and simulate cubic forms, are consistent with the monoclinic elements $a : b : c = 0.65462 : 1 : 0.67451$, $\beta = 85^\circ 37' 4''$. Forms observed are a (100), h (140), l (120), m (110), n (320), d (100), e (201), f ($\bar{1}04$), u (011), v (021), r (241), and an uncertain form o (210). The twin-plane is either $(\bar{1}22)$ or $(\bar{1}\bar{2}2)$, and trillings twinned on both planes are figured. A new chemical analysis by F. A. Gonyer of material separated from adherent smithsonite and malachite gives $\text{P}_2\text{O}_5 10.62$, $\text{PbO} 64.4$, $\text{CuO} 12.13$, $\text{ZnO} 0.54$, $\text{H}_2\text{O} + 12.09$, $\text{CO}_2 0.24$, total '99.79', yielding the formula $\text{Pb}_2\text{Cu}(\text{PO}_4)(\text{OH}) \cdot 3\text{H}_2\text{O}$. F. A. B.

MOND (W. E.) & GONYER (F. A.). *On pollucite*. Amer. Min., 1938, vol. 23, pp. 783-789, 2 figs.

Chemical analyses, X-ray and optical data are given for pollucite: glassy masses from Tamminen quarry, Greenwood, Maine; II, small crystals, forms *a* (100) and *n* (211), from Noyes Mountain, Greenwood, Maine; and III, irregular nodules up to an inch in diameter from Leontine, Massachusetts.

	SiO ₂ .	Al ₂ O ₃ .	CaO.	Cs ₂ O.	Na ₂ O.	K ₂ O.	H ₂ O.	Sp. gr.	<i>a</i> .	<i>n</i> .
I.	44.28	16.32	0.13	35.83	1.59	0.38	1.62	2.97	13.65 Å.	1.522
II.	50.07	17.19	0.09	24.54	4.34	0.17	3.81	2.68	13.64	1.507
III.	45.20	16.98	—	33.02	2.04	0.61	2.04	2.89	13.65	1.520

II, also Li₂O 0.09. Totals: I, 100.15; II, 100.30; III, 99.89.

Formulae deduced: I, (Cs,Na)₁₅Al₁₅Si₃₃O₉₆.4H₂O; II, (Cs,Na)₁₄Al₁₄O₉₃.9H₂O; III, (Cs,Na)₁₅Al₁₅Si₃₃O₉₆.5H₂O. Chemical analysis of white from Greenwood, Maine, gives SiO₂ 78.10, Al₂O₃ 16.64, Li₂O 5.13, 100.22, total 100.09, in agreement with the formula LiAlSi₄O₁₀.

F. A. B.

ALLER (W. T.) & FAIRCHILD (J. G.). *Cadmium in smithsonite from New Mexico*. Amer. Min., 1938, vol. 23, pp. 894-897, 1 fig.

Partial analyses of layers of smithsonite from Kelly mine, Magdalena district, Socorro Co., varying from milky-white to brown in colour show that most of the cadmium is present as carbonate and that only a trace of lithium sulphide is sufficient to produce a yellow colour. F. A. B.

LEBUT (Cornelius S., Jr.) & TAYLOR (Ralph E.). *Notes on minerals associated with hilgardite*. Amer. Min., 1938, vol. 23, pp. 898-902, 5 figs.

Insoluble residues with the brine from well within the Choctaw salt dome, Louisiana [M.A. 7-14, 217, 224], yield, in addition to the two new minerals hilgardite and parahilgardite, well-developed crystals of magnetite 0.1-3 mm., forms *a* (11 $\bar{2}$ 0), *r* (10 $\bar{1}$ 1), and *c* (0001); small cuboctahedra of boracite (new to America); colourless subparallel prismatic crystals of danburite up to 3 mm.; anhydrite, dolomite, pyrite, calcite, magnetite, sulphur, limonite, haematite, marcasite, hauerite, and gypsum.

F. A. B.

ALLER (Waldemar T.). *An unusual form of thaumasite from the Ducktown district, Tennessee*. Amer. Min., 1938, vol. 23, pp. 876-880, 1 fig.

Thaumasite from the Isabella mine usually occurs as small patches of needles in the seams of sulphide ores. An unusually fine spherulite,

composed of needles 1 cm. long showing the forms c (0001), m ($10\bar{1}0$), and e ($10\bar{1}2$), has refractive indices ϵ 1.468 and ω 1.506. There is no evidence that in this instance thaumasite is derived from a pre-existing calcic mineral.

F. A. B.

VOGT (Thorolf). *Thaumasite from Sulitelma, Norway*. Norsk Geol. Tidsskrift, 1938, vol. 18, pp. 291–303, 2 pls., 1 text-fig.

Wet thaumasite occurs in fissures in metamorphic rocks and more rarely in cavities in the pyritic ore in the Giken and other mines, and dries out to a chalk-like mass consisting of fine needles. Sp. gr. 1.88, ϵ 1.468, ω 1.5065. It is later than the associated zeolites and baryte and it replaces calcite. Analysis by E. Klüver, after deducting small amounts of chlorite, pyrite, and halite, gave SiO_2 9.78, CaO 27.2, Na_2O 0.04, SO_3 13.01, CO_2 7.12, H_2O 42.42 = 99.60, agreeing with $\text{CaSiO}_3 \cdot \text{CaCO}_3 \cdot \text{CaSO}_4 \cdot 14\frac{1}{2}\text{H}_2\text{O}$. At 95–120° $13\frac{1}{2}\text{H}_2\text{O}$ is lost and the remainder up to about 800°. The unit cell [M.A. 5–325] contains $\text{Ca}_6\text{Si}_2\text{C}_2\text{S}_2\text{O}_{18}(\text{OH})_4 \cdot 27\text{H}_2\text{O}$.

L. J. S.

IMORI (Satoyasu) & HATA (Shin). *Japanese thorogummite and its parent mineral*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 447–454, 4 figs.

A felspar quarry in pegmatite at Iisaka, Fukushima prefecture, has since 1936 yielded several rare minerals and sheets of biotite 1 m. across. Yellowish, powdery, gum-like thorogummite, sp. gr. 3.26–3.31, is an alteration product of yttrialite (following abstract), which is often present as a core with surrounding zones of reddish-brown and yellowish translucent material. Analyses of these show a gradual transition from yttrialite with diminishing rare-earths and increasing amounts of Th and UO_2 . Digestion of yttrialite in alkali carbonate solution extracts rare-earths more readily than ThO_2 and UO_2 . Analysis of the thorogummite gave: SiO_2 21.10, P_2O_5 1.77, $(\text{Nb}, \text{Ta})_2\text{O}_5$ 0.40, ThO_2 25.0, UO_2 7.91, ZrO_2 4.78, Yt earths 12.19, Ce earths 0.57, Al_2O_3 2.22, Fe_2O_3 8.67, BeO 0.40, PbO trace, MnO 0.35, CaO 0.95, $(\text{As}, \text{Sb})_2\text{O}_3$ 0.32, H_2O 10.80, CO_2 3.01 = 100.49. Formula, $(\text{RO}_2, \text{R}_2\text{O}_3, \text{RO})\text{SiO}_2 \cdot 2\text{H}_2\text{O}$. L. J.

HATA (Shin). *Yttrialite from Iisaka, Japan*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 455–459.

Yttrialite, previously known only from Texas, has been found massive in pegmatite at Iisaka, Fukushima prefecture. It is olive-green with resinous lustre, sp. gr. 4.31, H $6\frac{1}{2}$, isotropic, n 1.751. Analysis

29.91, TiO_2 0.05, ZrO_2 0.53, ThO_2 5.25, UO_2 3.72, Yt earths 44.70, earths 6.42, Al_2O_3 1.91, FeO 2.77, MnO 0.39, PbO 0.10, MgO 0.56, 0.90, $\text{H}_2\text{O} +$ 0.72, $\text{H}_2\text{O} -$ 0.45, CO_2 0.50 = 98.88. The atomic weight 110 of the rare-earth indicates the presence also of Gd, Dy, Er, and Y. Formula, $\text{R}_2\text{O}_3 \cdot 2\text{SiO}_2$. The $\text{Pb}/\text{U} + 0.38\text{Th}$ ratio gives an age of 131 million years. Yttrialite differs from thalenite in its colour, presence of cerium, and low water. L. J. S.

RI (Satoyasu) & HATA (S.). *Fergusonite from a new locality*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 504–507, 2 figs.

Large crystals in pegmatite from Iisaka show the forms c (001), l (111), x (131), and curved faces g (320), (241), (350), (351), (352). Sp. gr. 4.5.

Analysis gave Nb_2O_5 29.88, Ta_2O_5 16.26, TiO_2 0.72, SnO_2 0.11, 0.66, Yt earths 35.05, Ce earths 7.15, ThO_2 1.27, UO_2 5.43, ZrO_2 0.10, Al_2O_3 0.21, Fe_2O_3 0.60, MnO 0.10, CaO 2.54, PbO 0.10, ign. = 101.47. L. J. S.

RI (Takeo). *Tengerite found in Iisaka, and its chemical composition*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 832–841, 5 figs.

It occurs as a white powder or globular concretions in garnet shells and encrustations on yttrialite and felspar in pegmatite. It is minutely crystalline with pearly lustre, α 1.622, γ 1.642, sp. gr. 3.12. Analysis gave Y_2O_3 28.7, Yt earths 49.0, Ce earths 1.3, ThO_2 0.3, BeO 0.7, CaO 8.3, 0.2, SiO_2 0.8, Al_2O_3 , Fe_2O_3 traces, $\text{H}_2\text{O} +$ 10.1, $\text{H}_2\text{O} -$ 0.3 = 99.7. X-ray spectroscopic analysis shows predominant Yt with Dy, Gd, Er, and Th. Approximate formula $3\text{Yt}(\text{OH})\text{CO}_3 \cdot \text{CaCO}_3 \cdot 3\text{H}_2\text{O}$. The mineral is a secondary alteration product of yttrialite, having been produced together with columbite by the leaching by alkali carbonate solutions. It differs from the 'tengerite' from Texas (W.E. Hidden, 1905) in containing Ca instead of Be. The reddish-brown garnet (spessartine) has n 1.830, sp. gr. 3.81, and gave SiO_2 34.95, B_2O_3 0.15, Al_2O_3 14.80, Fe_2O_3 16.60, 22.28, rare-earth 2.45, BeO 0.39, CaO 4.52, Na_2O 1.67, K_2O 0.16, 0.45, CO_2 0.41 = 98.83. L. J. S.

RI (Satoyasu) & HATA (Shin). *Samarските found in the placer of Ryujomen, Korea*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 922–930, 2 figs.

Small crystals (a , b , e , h , p , Dana's letters) from auriferous gravel gave:

Ta₂O₅ 16.49 (31.07), Nb₂O₅ 33.55 (21.58), SiO₂ 0.16 (0.00), SnO₂ 0 (0.51), TiO₂ 1.57 (0.93), Al₂O₃ 1.67 (0.62), Ce earths 2.23, Yt earths 5 (0.51), ThO₂ 1.92 (0.63), UO₂ 22.84 (17.84), UO₃ 0.35 (—), FeO 10.08 (10.04), MnO 0.64 (2.11), CaO 0.67 (0.76), MgO 0.54 (1.1), PbO 0.40 (0.51), totals 99.77 (100.05), sp. gr. 5.95–6.05 (5.7). Formula $R_3''R_2'''R^{iv}(Nb,Ta)_6O_{23}$, or as a mixture of ortho- and pyro-niobotantalates $R_3''(Nb,Ta)_2O_8 \cdot 2R'''(Nb,Ta)_4R^{iv}(Nb,Ta)_2O_7$. The age is 1 million years, corresponding to intrusion of pegmatites in the Jurassic period. L. J. S.

IIMORI (Satoyusa) & HATA (Shin). *Tantalite occurring in a Korean gold placer*. Sci. Papers Inst. Phys. Chem. Research, Tokyo, 1938, vol. 34, pp. 1010–1013, 3 figs.

Small crystals (*amongst*, Dana's letters) from auriferous gravel. Ryujo men gave: Ta₂O₅ 54.06, Nb₂O₅ 24.96, TiO₂ 0.83, SiO₂ 0.94, Al₂O₃ 1.64, rare-earths 0.07, FeO 9.19, MnO 5.62, CaO 2.77 = 100.08, sp. gr. 6.75. L. J. S.

YOSIMURA (Toyohumi) [formerly Toyofumi YOSHIMURA]. *Thulite from Myōzinzima, Sisakazima Islands, Japan*. Journ. Fac. Sci. Hokkaido Univ., Ser. 4, 1938, vol. 4, pp. 17–22, 3 figs.

Pink spots and veinlets of minute crystals of thulite occur at the contact of pegmatite and aplite with lenses of limestone and amphibolite gneisses. It appears to have been derived from the epidote in the basic rocks. Sp. gr. 3.23, $\alpha (= b)$ 1.705, $\gamma (= a)$ 1.710, positive. Analysis, after deducting 18.7% quartz and calcite, SiO₂ 39.26, Al₂O₃ 32.08, Fe₂O₃ 0.1, FeO 4.06, MnO 0.29, CaO 20.83, MgO 0.59, H₂O 1.97 = 100.00, agrees with $H_2(Ca,Fe)_4Al_6Si_6O_{26}$. L. J. S.

HARADA (Zyūnpéi). *Über die optischen Daten des Danburits von Ōbuki Mitaté, Miyazaki Präfektur*. (Studien über japanischen Bormineralien. II). Journ. Fac. Sci. Hokkaido Univ., Ser. 4, 1938, vol. 4, pp. 1–6, 2 figs.

— *Neue Vorkommen von weingelbem Danburit aus Obira, Ōita Präfektur* (— III). Ibid., pp. 7–10, 6 figs.

— *Danburit von Toroku, Miyazaki Präfektur*. (— IV). Ibid., pp. 153–164, 14 figs. [Cf. M.A. 5–38, 479.]

In the tin mine at Ōbuki massive greenish danburite occurs in the skarn of the limestone contact-zone, and a few minute crystals are found. Refractive indices are given for several wave-lengths; for Na α 1.630.

331₄, γ 1.6360₁; sp. gr. 3.001. In a new tin mine, the Kōmori mine, Bira, transparent wine-yellow crystals (the largest $4 \times 2 \times 1.5$ cm.) of tourmaline were found in a cavity in the contact-zone between slates and granite-porphry. The previous finds of colourless crystals at this locality were from the neighbouring Syōdō mine. At Toroku colourless white and cloudy crystals (up to $7 \times 2.5 \times 2.5$ cm.) occur with tourmaline, axinite, &c., in the limestone and granite-porphry contact-zone. Pyroclastic crystals of two types are described and 19 crystal-forms noted; sp. gr. 2.998, α 1.6303, β 1.6334, γ 1.6364 (Na). Analysis by R. Hiratuka: SiO₂ 48.22, B₂O₃ 28.56, Al₂O₃ 0.22, Fe₂O₃ 0.44, MgO 0.11, CaO 0.09, H₂O 0.32 = 100.16.

L. J. S.

YAMADA (Zyunpei). *Beiträge zur Kenntnis der chemischen Eigenschaften des Ludwigits von Hol-Kol bei Suan, Korea. (Studien über japanischen Bormineralien. V).* Journ. Fac. Sci. Hokkaido Univ., Ser. 4, 1938, vol. 4, pp. 165–171, 1 fig.

Disseminating clusters of ludwigite fibres occur in metamorphic dolomitic limestone. In thin section it is almost opaque with very strong pleochroism, α and β dark green, γ very dark brown; Bx_a = γ parallel to length of fibre; sp. gr. 3.907. Analysis by R. Hiratuka (after deducting 10% calcite and some forsterite), B₂O₃ 18.81, Al₂O₃ 3.48, Fe₂O₃ 1.77, FeO 9.83, MnO 0.16, MgO 31.41, H₂O 2.94 = 100.00, agrees with 100.00.R₂O₃.B₂O₃, or, as the material is magnetic,

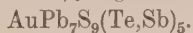


Water is probably adsorbed. [M.A. 1–204, 353.]

L. J. S.

SCĂ (Dan). *Le chimisme de la nagyagite.* Bul. Soc. Române Geol., 1937, vol. 3, pp. 118–121, 1 fig.

Nagyagite from Săcărâmb (= Nagyág), Romania, taken from five specimens, was carefully freed from enclosures of galena, altaite, and pyrite. Six analyses, Au 7.57–8.20, Pb 55.90–56.45, S 10.64–11.87, Sb 15.55–16.54, agree with the formula



L. J. S.

ANDER (Miroslav). *Klinoklor sa Dobrog Polja.—Klinochlor von Dobro Polje.* Vesnik Geol. Inst. Jugoslavije (Bull. Inst. Geol. Yougoslavie), 1938, vol. 6, pp. 235–238. (Croatian with German summary.)

Green scales of clinochlore forming veins in serpentine from southern Bosnia gave SiO₂ 30.62, Al₂O₃ 17.51, Fe₂O₃ 1.60, FeO 3.62, MnO 0.35,

A—B b

MgO 32.35, $H_2O + 12.62$, $H_2O - 1.54 = 100.21$, corresponding with
At 52.6, Sp 47.4%. $2V\ 0-36^\circ$, n (mean of α and β) 1.583, $\gamma - \alpha\ 0.0088$.
L. J. S.

TAJDER (Miroslav). *Nemalit od Lojana*.—*Nemalith von Lojane*. Vesnik
Geol. Inst. Jugoslavije (Bull. Inst. Geol. Yougoslavie), 1938, vol.
pp. 239-240. (Croatian with German summary.)

JONG (W. F. de). *Nemalith von Lojane*.—*Nemalit od Lojana*. Ibid.
pp. 241-242.

Fibrous aggregates from the Lojane chromite mine, Serbia, gave
MgO 67.63, FeO 2.26, $H_2O\ 30.41$, $SiO_2\ 0.09 = 100.39$, agreeing with
 $Mg(OH)_2$. α (parallel fibre) 1.5668, $\beta\ 1.5690$, $\gamma - \alpha\ 0.0222$, $2V\ 34-39^\circ$.
X-ray photographs show the identity of the mineral with brucite, with
the fibre parallel to the a -axis; $a\ 3.12$, $c\ 4.72\ \text{\AA}$. In some other brucites
while the fibre is perpendicular to the c -axis it is not parallel to the a -axis.

L. J. S.

BARIĆ (Ljudevit). *Vulfenit iz doline Kravaričkoga potoka nedaleko Krepoljina u sjeveroistočnoj Srbiji*.—*Wulfenit aus dem Kravarica-Tal nächst Krepoljin in Nordost-Serbien*. Vesnik Geol. Inst. Jugoslavije (Bull. Inst. Geol. Yougoslavie), 1938, vol. 7, pp. 205-213, 5 figs. (Croatian with German summary.)

Minute ($\frac{1}{4}$ — $1\frac{1}{2}$ mm.) yellow crystals of wulfenite, occurring with sulphides in limestone invaded by trachyte, are thin plates on c (001) or low pyramids with predominating z (025). Fifteen crystal-forms, including new ν (027), and 22 combinations of forms are noted [Dana's axes: $\omega\ 2.42$, $\epsilon\ 2.34$.]

L. J. S.

MÉLON (J.). *Description des chlorites et clintonites belges*. Mém. (in-8°) Acad. Roy. Belgique, Cl. Sci., 1938, vol. 17, no. 4, 73 pp., 2 figs.

Modes of occurrence and optical data are given for 46 chlorites from various localities in Belgium and neighbouring regions in France. New analyses are: I, klementite from Vielsalm, dark olive-green in phyllite, $2V\ 0-20^\circ$, positive; $8RO.3R_2O_3.5SiO_2.7H_2O$. II, chlorite from Regné, quartz vein in phyllite, $2V\ 0-15^\circ$, positive. III, from Serpont, Recogné, quartz vein in phyllite, $2V$ small, negative; $9RO.4R_2O_3.6SiO_2.9H_2O$. IV, from Lembecq, quartz vein in diorite, $2V\ 0^\circ$ or small, negative; $8RO.3R_2O_3.6SiO_2.9H_2O$. V, from Nil-Saint-Vincent, in quartzite, $2V\ 0-20^\circ$, positive; $7RO.3R_2O_3.5SiO_2.7H_2O$. Salmite ($\alpha\ 1.714$, $\beta\ 1.717$).

730, 2V 50—60°, positive) and ottrelite (optically triclinic and distinct from chloritoid) are also described.

SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	H ₂ O (550°)	H ₂ O (750°)	Sp.gr.	α.	γ.
27.56	24.47	3.85	10.51	1.80	20.86	7.90	3.45	2.832	1.606	1.615
27.94	26.02	1.93	9.00	1.10	22.36	7.60	3.54	2.82	1.600	1.608
23.74	24.90	4.48	26.21	0.52	10.12	7.45	3.20	3.063	1.636	1.638
27.79	20.65	6.05	13.76	0.16	18.29	9.25	4.05	2.718	1.604	1.609
25.12	24.02	4.86	23.26	0.18	12.19	7.64	3.26	2.950	1.636	1.638

L. J. S.

VAVRINECZ (Gábor). *Ásványrendszertani tanulmányok. II. Közlemény: A chloritcsoport.*—VAVRINECZ (Gabriel). *Mineralsystematologische Studien. II. Die Chloritgruppe.* Földtani Közlöny, Budapest, 1936, vol. 66, pp. 242–253; 1937, vol. 67, pp. 46–63. (German with Hungarian summary.)

Schermak's theory for the components of the chlorite group seems to be the most probable. Statistical treatment of analyses shows that the chlorite-amesite series (chlorites) is practically continuous. The leptochlorites could not be systematized, owing to lack of good analyses and many data. A system of the orthochlorites, lists of synonyms of the chlorite, chlorite-like minerals, and fundamental compounds are given.

V. Z.

BODY (László). *Magyarországi piritek kristálytani vizsgálata.* [Crystallographical researches on Hungarian pyrite.] Mat. Term.-tud. Közlemények vonatkozólag a hazai viszonyokra, Budapest, 1938, vol. 38, no. 2, pp. 1–55, 42 figs. (Hungarian only.)

Crystallographical researches on pyrite from 20 Hungarian localities published the following 38 new forms: (15.4.0) [doubtful] from Bucsum, com. Alsó-Fehér; (15.15.14) [vicinal form], (13.13.7), (17.13.13) [vicinal], (14.9.9) [doubtful], (11.4.4) [doubtful], and (12.6.7) from Déva, com. Hunyady; (11.6.0) from Felsőkénesd, com. Hunyad; (17.7.7), (15.5.5), (37.18.18) [vicinal to (211)], and (26.13.2) from Hodrusbánya, com. Hont; (17.18.0) from Kapnikbánya, com. Szatmár; (11.17.0), (13.7.0), (16.7.2), (32.29.4) [vicinal to the unknown form (871)], (845), (18.9.10) from Nagyág, com. Hunyad; (17.33.0) from Ó-Radna, com. Beszterce-Naszód; (33.32.0) [vicinal], (1.11.0), (380), (5.12.0), (17.0), (350), (7.10.0), (17.20.0), (9.10.0), (27.16.4) [vicinal], (17.12.3) [vicinal], and (762) from Porkura, com. Hunyad; (16.11.0), (14.11.0), (10), (11.45.0), and (13.6.6) from Valea mori, com. Hunyad; (16.16.1) com. Zsibolt, com. Alsó-Fehér.

V. Z.

TOKODY (László). *Persbergi kalcit és barit.*—TOKODY (L.). *Kalzit und Baryt von Persberg (Schweden)*. Mat. Term.-tud. Értesítő, Budapest, 1938, vol. 57, pp. 1096–1107, 2 figs. (Hungarian with German summary.)

Colourless crystals of calcite (4.5×4 mm.), on an aggregate of diopside, magnetite, actinolite, coarse crystalline calcite, and garnet, show the forms *c M r e t w E v* (Dana's letters), (11.0. $\overline{11.1}$), (14 $\overline{59}$), (7.2. $\overline{9.11}$) (52 $\overline{73}$), (7.3. $\overline{10.4}$), (9.4. $\overline{13.5}$), (10.4. $\overline{14.3}$), (16.8. $\overline{24.5}$), (14.12. $\overline{26.5}$) (9.1. $\overline{10.2}$), (43 $\overline{72}$), and new (11.0. $\overline{11.4}$), (2.11. $\overline{13.24}$), (2.5. $\overline{7.12}$), (8.3. $\overline{11.5}$) (13.5. $\overline{18.8}$), (17.7. $\overline{24.10}$). The predominating forms are *v*, *M*, (43 $\overline{72}$), and *r*. Pale rose or colourless crystals of baryte up to 1 mm. and containing considerable amounts of manganese and traces of P_2O_5 show the forms *b c o m v q f r z*. V. Z.

MALLET (J.). *Sur l'identité de la hallérite et de la muscovite lithinifère*. Bull. Soc. Franç. Min., 1938, vol. 61, pp. 209–211.

A new analysis of 'hallerite' (P. Barbier, 1908) from Mesvres, Autun gave SiO_2 46.76, Al_2O_3 33.66, Cr_2O_3 trace, Fe_2O_3 1.29, FeO 0.98, Na_2O 3.04, K_2O 8.86, Li_2O 0.36, $H_2O +$ 4.90, $H_2O -$ 0.02 = 99.87; sp. gr. 2.817, α 1.554, β 1.590, γ 1.597. The original analysis, on which the name was based, showed Na_2O 5.64, K_2O 2.51, Li_2O 0.76. L. J. S.

FENOGLIO (Massimo). *Ricerche sulla brugnatellite*. Periodico Min. Roma, 1938, vol. 9, pp. 1–13, 2 pls.

Analyses of brugnatellite from I, Cogne (and II, Viù), Piedmont: CO_2 7.45 (8.04), Fe_2O_3 12.98 (14.65), MnO 1.92 (1.98), MgO 43.08 (40.36), H_2O 33.25 (33.50), insol. 1.05 (1.15) = 99.73 (99.68), agree with $MgCO_3 \cdot 5Mg(OH)_2 \cdot Fe(OH)_3 \cdot 4H_2O$; sp. gr. 2.140. The refractive indices (ω 1.533–1.540) and X-ray data (a 5.47, c 15.97, trigonal) also distinguish it from pyroaurite ($MgCO_3 \cdot 5Mg(OH)_2 \cdot 2Fe(OH)_3 \cdot 4H_2O$). [M. 1–175, 2–240, 5–287.] L. J. S.

FENOGLIO (Massimo). *Sulla presenza dell'epidoto nella tonalite di V. Nambrone (gruppo dell' Adamello)*. Periodico Min. Roma, 1938, vol. 9, pp. 19–23, 1 fig.

Minute crystals of yellow epidote showing eight crystal-forms occur in small druses in the tonalite rock. Sp. gr. 3.440, β 1.740. Analysis: SiO_2 40.21, TiO_2 0.37, Al_2O_3 23.36, Fe_2O_3 9.80, FeO 1.71, MgO 0.2, CaO 21.51, $H_2O +$ 2.52, $H_2O -$ 0.10 = 99.85. L. J. S.

DOLINO (Rinaldo). *Sopra l'epidoto delle "Gouffres" di Busserailles in Valtournanche (Val d'Aosta)*. Periodico Min. Roma, 1938, vol. 9, pp. 25-34, 3 figs.

Small brilliant crystals of pale yellow epidote occurring with diopside, actinolite, &c., in veins in serpentine show 38 crystal-forms. Sp. gr. 3.339, $d_{110} 1.530$, $\alpha:c = +3^{\circ}54'$, $2V 83^{\circ}56'$. Analysis gave SiO_2 38.46, Al_2O_3 11.09, Fe_2O_3 4.60, FeO 1.05, MgO 0.25, CaO 22.59, $\text{H}_2\text{O} + 2.26 = 100.40$.

L. J. S.

DOLINO (Rinaldo). *La prehnite della "Gouffres" di Busserailles in Valtournanche (Val d'Aosta)*. Periodico Min. Roma, 1938, vol. 9, pp. 265-272, 1 fig.

Isolated crystals of prehnite are elongated along the a -axis and show forms a (100), c (001), o (011), n (104), (102) [$a:b:c = 0.842:1:3.357$; $d_{110} 1.515$ -1.586]. Sp. gr. 2.928, α 1.6188, β 1.6250, γ 1.6433 (Na). Analysis gave SiO_2 42.86, Al_2O_3 26.55, Fe_2O_3 0.08, FeO 0.65, MnO trace, MgO 0.02, CaO 25.18, $\text{H}_2\text{O} + 4.86 = 100.18$.

L. J. S.

ERILLO (Antonio). *Le cloriti dei filoni di quarzo aurifero dell'Eritrea*. Periodico Min. Roma, 1938, vol. 9, pp. 71-76.

Aggregates of dark-green scaly chlorite occur in gold-quartz veins at several localities. Analysis of material containing the least amount of mixed quartz and carbonates from Gola-Gul gave SiO_2 24.67, Al_2O_3 11.02, Fe_2O_3 6.60, FeO 22.70, MnO 0.15, MgO 11.58, CaO 0.42, Na_2O 0.02, K_2O 0.46, $\text{H}_2\text{O} + 10.91$, $\text{H}_2\text{O} - 0.44$, CO_2 0.13 = 100.21. This is compared with aphrosiderite [M.A. 1-206].

L. J. S.

ERILLO (Antonio). *La celadonite delle rocce eruttive dell'altipiano eritreo*. Periodico Min. Roma, 1938, vol. 9, pp. 253-264, 1 fig.

Celadonite occurs with zeolites in amygdaloidal basalts in Eritrea. Material from the Toselli pass, Amba Alagi, gave SiO_2 50.70, Al_2O_3 4.72, Fe_2O_3 15.34, FeO 2.00, MnO trace, MgO 9.32, CaO 1.32, Na_2O 0.29, K_2O 0.44, H_2O 12.52 = 100.65; formula $\text{H}_2\text{KMg}_3\text{Fe}'''_3(\text{SiO}_3)_9 \cdot n\text{H}_2\text{O}$. Dehydration curve is given; loss at 110° 5.36%, at 425° 8.37%.

L. J. S.

GUZZI (Carlo). *Contributo alla conoscenza delle affinità vesuviane*. Periodico Min. Roma, 1938, vol. 9, pp. 359-373, 1 fig.

Alkaline encrustations with columnar structure collected on Vesuvius

in 1933 (and 1934), consisting mainly of apthitalite with some sylvite, haematite, and tenorite, gave ω 1.493 (1.494), ϵ 1.500 (1.501), SO_3 51 (48.39), Cl 0.23 (0.09), SiO_2 0.04 (—), Al_2O_3 0.40 (—), Fe_2O_3 1.01 (—), FeO 0.06 (0.19), CuO 0.70 (0.89), ZnO — (0.50), MnO 0.02 (0.02), CaO 0.18 (—), Na_2O 17.49 (12.54), K_2O 28.54 (37.00), H_2O 0.21 (—) 100.20 (99.62); the first corresponding to 89.24% KNaSO_4 , and 3.6% K_2SO_4 , and the second to 63.83% KNaSO_4 and 33.55% K_2SO_4 . Crystals of prismatic habit of pale blue apthitalite, crystallized at 30° from a solution containing 10g. $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, 5.53g. K_2SO_4 , and $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, had ω 1.494, ϵ 1.500, SO_4 58.09, K 34.51, Na 7.20, Cu 0.18. It is suggested that the columnar prismatic habit is influenced by the presence of copper.

L. J. S.

GÄDEKE (Rudolf). *Die gesetzmäßigen Zusammenhänge und Anomalien der Vesuviangruppe und einigen anderen Kalksilikaten*. *Chemie der Erde*, 1938, vol. 11, pp. 592–636, 14 figs.; Inaug.-Diss., Univ. Halle-Wittenberg.

Chemical analyses with optical data and density are given of idocrase (4 normal, 5 optically anomalous), prehnite (4), axinite (5), and garnet (1). Others are tabulated from the literature, and the results are plotted to show the variation of the physical characters with replacement of Al-Fe^{III}, Si-Ti, H₂O-F, Mg-Fe^{II}, Fe^{II}-Mn, Ca-Mn, and Ca-Na.

L. J. S.

TEMPEL (Horst-Günter). *Der Einfluß der seltenen Erden und einiger anderer Komponenten auf die physikalisch-optischen Eigenschaften innerhalb der Epidotgruppe*. *Chemie der Erde*, 1938, vol. 11, pp. 511–551, 11 figs.

Analyses of epidote from: I, Rothenkopf, Zillerthal, Tirol; II, Isère valley, Piedmont; III, Zermatt, Switzerland; IV, Pitkäranta, Finland; V, Nordmark, Sweden; VI, Bourg d'Oisans, Dauphiné. Orthite from VII, Hitterö, Norway; VIII, Riddarhyttan, Sweden; IX, Schwarzwald, Crux, Schmiedefeld, Thuringia; X, from syenite, Plauenscher Grund, Dresden, Saxony. Earlier analyses and optical data are tabulated, and plots show that in epidote there is a linear increase in refractive indices and birefringence, and specific gravity with increase in iron. In orthite, n and sp. gr. increase, but less regularly, with increasing iron and rare-earth content and decrease with increasing water.

SiO ₂ .	TiO ₂ .	Al ₂ O ₃ .	Fe ₂ O ₃ .	FeO.	MnO.	Ce ₂ O ₃ .	Yt ₂ O ₃ .	CaO.	MgO.
37.80	0.10	27.63	7.62	0.19	0.04	—	—	24.56	0.29
37.70	0.08	24.36	11.07	0.29	—	—	—	24.10	0.52
37.14	0.08	24.13	12.55	0.29	0.04	—	—	24.15	—
36.12	0.09	22.76	13.75	0.63	0.34	—	—	23.60	0.72
37.00	0.10	22.77	14.12	0.30	0.02	—	—	23.10	0.68
36.74	—	21.62	15.07	0.34	0.01	—	—	24.14	0.32
32.70	0.38	18.42	5.47	8.35	—	18.64	1.21	10.56	1.40
31.46	—	17.56	3.67	10.40	0.95	21.56	3.39	6.14	1.32
31.86	—	11.41	9.87	8.78	0.23	18.88	3.21	11.28	1.58
31.09	0.63	16.47	4.50	9.30	0.92	19.14	3.46	10.10	1.74

Na ₂ O.	K ₂ O.	H ₂ O.	Total.	Sp. gr.	α .	β .	γ .	$\gamma - \alpha$.	n .
—	—	1.83	100.06	3.324	1.712	1.723	1.735	0.023	—
—	—	1.76	99.88	3.382	1.720	1.738	1.753	0.033	—
—	—	1.74	100.12	3.405	1.722	1.743	1.760	0.038	—
—	0.23	1.82	100.06	3.415	1.724	1.746	1.765	0.041	—
—	—	1.94	100.03	3.423	1.724	1.749	1.768	0.044	—
—	—	1.90	100.14	3.446	1.726	1.755	1.772	0.046	—
0.43	0.67	1.63	99.86	3.740	—	—	—	—	1.740
—	0.48	2.92	99.55	3.728	—	—	—	—	1.746
—	0.36	2.96	100.42	3.723	—	—	—	—	1.745
0.23	0.38	2.21	100.17	3.638	—	—	—	—	1.725

L. J. S.

RY (L. G.). *On the pseudocopiapite of Ungemach*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 7–18, 2 pls.

re-examination of the original crystals [M.A. 6–149] gave, in a new tag, $a:b:c = 0.4007:1:0.4005$, $\alpha 91^\circ 22'$, $\beta 102^\circ 22'$, $\gamma 98^\circ 50'$, and for unit cell $a 7.26$, $b 18.67$, $c 7.45 \text{ \AA.}$; sp. gr. 2.147, $\alpha 1.510$, $\beta 1.531$, $\gamma 1.578$, $2V 56^\circ$, positive. These data do not distinguish 'pseudocopiapite' from copiapite.

L. J. S.

N (V. Ben). *An unusual cancrinite*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 35–38.

white cancrinite fills veins (1–4 inches wide), with the distinct prismatic cleavage perpendicular to the walls, in nepheline in a new nepheline quarry near Bancroft, Ontario. Sp. gr. 2.476, $\omega 1.528$, $\epsilon 1.503$. Analysis, SiO₂ 35.38, Al₂O₃ 28.42, CaO 11.66, Na₂O 9.82, K₂O 1.23, H₂O 6.18, Cl 0.08, SO₃ 0.19, H₂O + 6.39, H₂O – 0.60 = 99.95, shows high alkali and H₂O, and low Na₂O. Formula, (Na,K)_{3.5}Ca₂Al₆Si₆O₂₄·1½CO₂·nH₂O.

L. J. S.

CE (A. T.). *A study of Canadian sphene*. Univ. Toronto Studies, Geol. Ser., 1938, no. 41, pp. 59–66, 4 pls.

dark-brown crystals (½–4 inches) of sphene from Lake Clear, Renfrew County, Ontario, show the forms $c a m S n l t$ [Dana's letters] and are of three types: tabular on $c(001)$; prismatic along $n(111)$; prismatic along $l(100)$ and always twinned on (100). Extinction-angle $\gamma:c = +46\frac{1}{4}^\circ$ to $+46\frac{3}{4}^\circ$ (yellow), $+47\frac{3}{4}^\circ$ (green); $2V 46^\circ$ (red), 45° (yellow), 43° (green).

Analysis gave SiO_2 28.76, TiO_2 32.76, Al_2O_3 6.32, Fe_2O_3 2.73, FeO 1.0, MnO 0.03, CaO 27.97 = 99.64. Formula, $(\text{Ca}, \text{R}''', \text{R}'')(\text{Ti}, \text{Al})(\text{Si}, \text{Al})\text{O}_5$.
L. J. S.

FERMOR (Sir Lewis Leigh). *Garnets and their role in nature*. Indian Assoc. Cultiv. Sci., 1938, Spec. Publ. no. 6, 105 pp., 2 pls., 25 text figs. Price Rs. 2-8 = 4s.

A series of lectures recapitulating the author's previous papers (since 1912) and collecting together various data on garnets: (1) chemical composition, atomic structure, physical properties; (2) as rock constituent; (3) speculations on the infra-plutonic shell of the earth. An eclogite shell is postulated. On the release of pressure the dense high-pressure garnet is transformed into other minerals with liberation of heat and increase in volume. This is offered as an explanation of fissure eruptions of basaltic isostasy, deep-focus earthquakes, and the formation of chondritic meteorites [M.A. 7-169].
L. J. S.

MACKOWSKY (Marie-Therese). *Über die chemisch-physikalischen Zusammenhänge in den Granatsystemen Grossular-Melanit und Melan Titanmelanit unter dem Einfluß des Eisens bzw. Titans*. Chem. Erde, 1939, vol. 12, pp. 123-157, 10 figs.

Chemical analyses with determinations of density, refractive indices and lattice dimensions are given for nine andradites from various known localities. Fe_2O_3 ranges from 20.68 to 30.14, and Al_2O_3 0.13-7.53%. The physical data show a linear increase with increase in Fe_2O_3 and TiO_2 . For pure andradite are calculated d 3.750, n 1.895, a 12.033 Å., and grossular d 3.530, n 1.735, a 11.840 Å. The 'Titanmelanit' from Franklin Furnace and Sterling Hill, New Jersey, is black andradite containing only 0.47-0.75% TiO_2 .
L. J. S.

McCONNELL (Duncan). *Note on the chemical similarity of idocrase and certain garnets*. Amer. Min., 1939, vol. 24, pp. 62-63, 1 fig.

Plotting 49 chemical analyses of garnet and idocrase shows that the most apparent difference in their compositions is the relatively greater abundance of $(\text{Ca}, \text{Mg}, \text{Mn}, \text{Fe}, \text{K}_2, \text{Na}_2)\text{O}$ in idocrase.
F. A. B.

HARWOOD (H. F.). *Analyses of rocks and minerals*. Ann. Rep. Chem. Soc. London, 1938, vol. 34 (for 1937), pp. 464-480.

A summary of recent methods, with a warning in the case of microanalyses.
L. J. S.